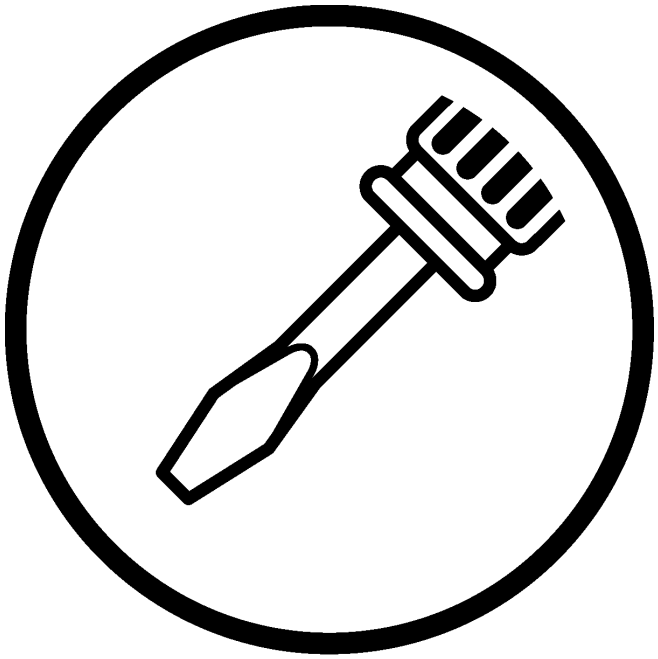
SERVICE MANUAL

S-7200B
(MD-741B, 751B, 741C, 751C)

Please read this manual before making any adjustments.

SINGLE NEEDLE DIRECT DRIVE STRAIGHT LOCK STITCHER
WITH THREAD TRIMMER



brother®

This service manual is intended for S-7200B; be sure to read the S-7200B instruction manual before this manual.

Carefully read the “SAFETY INSTRUCTIONS” and the whole of this manual to understand this product before you start maintenance.

As a result of research and improvements regarding this product, some details of this manual may not be the same as those for the product you purchased.
If you have any questions regarding this product, please contact a Brother dealer.

SAFETY INSTRUCTIONS

[1] Safety indications and their meanings

This service manual and the indications and symbols that are used on the machine itself are provided in order to ensure safe operation of this machine and to prevent accidents and injury to yourself or other people.
The meanings of these indications and symbols are given below.

Indications

DANGER	The instructions which follow this term indicate situations where failure to follow the instructions will result in death or serious injury.
CAUTION	The instructions which follow this term indicate situations where failure to follow the instructions could cause injury when using the machine or physical damage to equipment and surroundings.

Symbols

. . . . . This symbol (△) indicates something that you should be careful of. The picture inside the triangle indicates the nature of the caution that must be taken.
(For example, the symbol at left means “beware of injury”.)

. . . . . This symbol (⃠) indicates something that you must not do.

. . . . . This symbol (●) indicates something that you must do. The picture inside the circle indicates the nature of the thing that must be done.
(For example, the symbol at left means “you must make the ground connection”.)

[2] Notes on safety

⚠ DANGER

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

⚠ CAUTION

Environmental requirements

Use the sewing machine in an area which is free from sources of strong electrical noise such as electrical line noise or static electric noise.
Sources of strong electrical noise may cause problems with correct operation.

Any fluctuations in the power supply voltage should be within ±10% of the rated voltage for the machine.
Voltage fluctuations which are greater than this may cause problems with correct operation.

The power supply capacity should be greater than the requirements for the sewing machine's power consumption.
Insufficient power supply capacity may cause problems with correct operation.

The ambient temperature should be within the range of 5°C to 35°C during use.
Temperatures which are lower or higher than this may cause problems with correct operation.

The relative humidity should be within the range of 45% to 85% during use, and no dew formation should occur in any devices.
Excessively dry or humid environments and dew formation may cause problems with correct operation.

In the event of an electrical storm, turn off the power and disconnect the power cord from the wall outlet.
Lightning may cause problems with correct operation.

Installation

Machine installation should only be carried out by a qualified technician.

Contact your Brother dealer or a qualified electrician for any electrical work that may need to be done.

The sewing machine weighs more than 44 kg. The installation should be carried out by two or more people.

Do not connent the power cord until installation is complete. The machine may operate if the treadle is depressed by mistake, which could result in injury.

Turn off the power switch before inserting or removing the plug, otherwise damage to the control box could result.

Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.

When securing the cords, do not bend the cords excessively or fasten them too hard with staples, otherwise there is the danger that fire or electric shocks could occur.

If using a work table which has casters, the casters should be secured in such a way so that they cannot move.

Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.

Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result.
Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhea.
Keep the oil out of the reach of children.

⚠ CAUTION

Sewing

This sewing machine should only be used by operators who have received the necessary training in safe use beforehand.

The sewing machine should not be used for any applications other than sewing.

Be sure to wear protective goggles when using the machine.
If goggles are not worn, there is the danger that if a needle breaks, parts of the broken needle may enter your eyes and injury may result.

Turn off the power switch at the following times.
The machine may operate if the treadle is depressed by mistake, which could result in injury.
- When threading the needle
- When replacing the bobbin and needle
- When not using the machine and when leaving the machine unattended

If using a work table which has casters, the casters should be secured in such a way so that they cannot move.

Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.

Do not touch any of the moving parts or press any objects against the machine while sewing, as this may result in personal injury or damage to the machine.

Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.

If an error occurs in machine, or if abnormal noises or smells are noticed, immediately turn off the power switch. Then contact your nearest Brother dealer or a qualified technician.

If the machine develops a problem, contact your nearest Brother dealer or a qualified technician.

Cleaning

Turn off the power switch before carrying out cleaning. The machine may operate if the treadle is depressed by mistake, which could result in injury.

Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.

Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result.
Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhea.
Keep the oil out of the reach of children.

Use only the proper replacement parts as specified by Brother.

Maintenance and inspection

Disassembly, assembly, maintenance and inspection of the sewing machine should only be carried out by a qualified technician.

Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.

Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.
- When carrying out inspection, adjustment and maintenance
- When replacing consumable parts such as the rotary hook and knife

Turn off the power switch before inserting or removing the plug, otherwise damage to the control box could result.

If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

Use both hands to hold the machine head when tilting it back or returning it to its original position.
If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.

Use only the proper replacement parts as specified by Brother.

If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.

[3] Warning labels

The following warning labels appear on the sewing machine.
Please follow the instructions on the labels at all times when using the machine. If the labels have been removed or are difficult to read, please contact your nearest Brother dealer.

1

	⚠ 危 険	⚠ 危 险
	高電圧部分にふれて、大けがをすることがある。電源を切り、5分たってからカバーをはずすこと。	触摸高压电部分，会导致受伤。在切断电源5分钟后，再开启盖罩。

⚠ DANGER	⚠ GEFAHR	⚠ DANGER	⚠ PELIGRO
Hazardous voltage will cause injury. Turn off main switch and wait 5minutes before opening this cover.	Hochspannung verletzungsgefahr! Bitte schalten sie den hauptschalter aus und warten sie 5 minuten, bevor sie diese abdeckung öffnen.	Un voltage non adapte provoque des blessures. Eteindre l'interrupteur et attendre 5 minutes avant d'ouvrir le capot.	Un voltaje inadecuado puede provocar las heridas.Apagar el interruptor principal y esperar 5 minutos antes de abrir esta cubierta.

2

⚠ 注 意

触摸运动部分,易造成受伤。
所以在装上安全保护装置后，
再进行缝纫操作。在切断电源后，
进行穿线,更换梭芯，
机针和做清扫,调整工作。

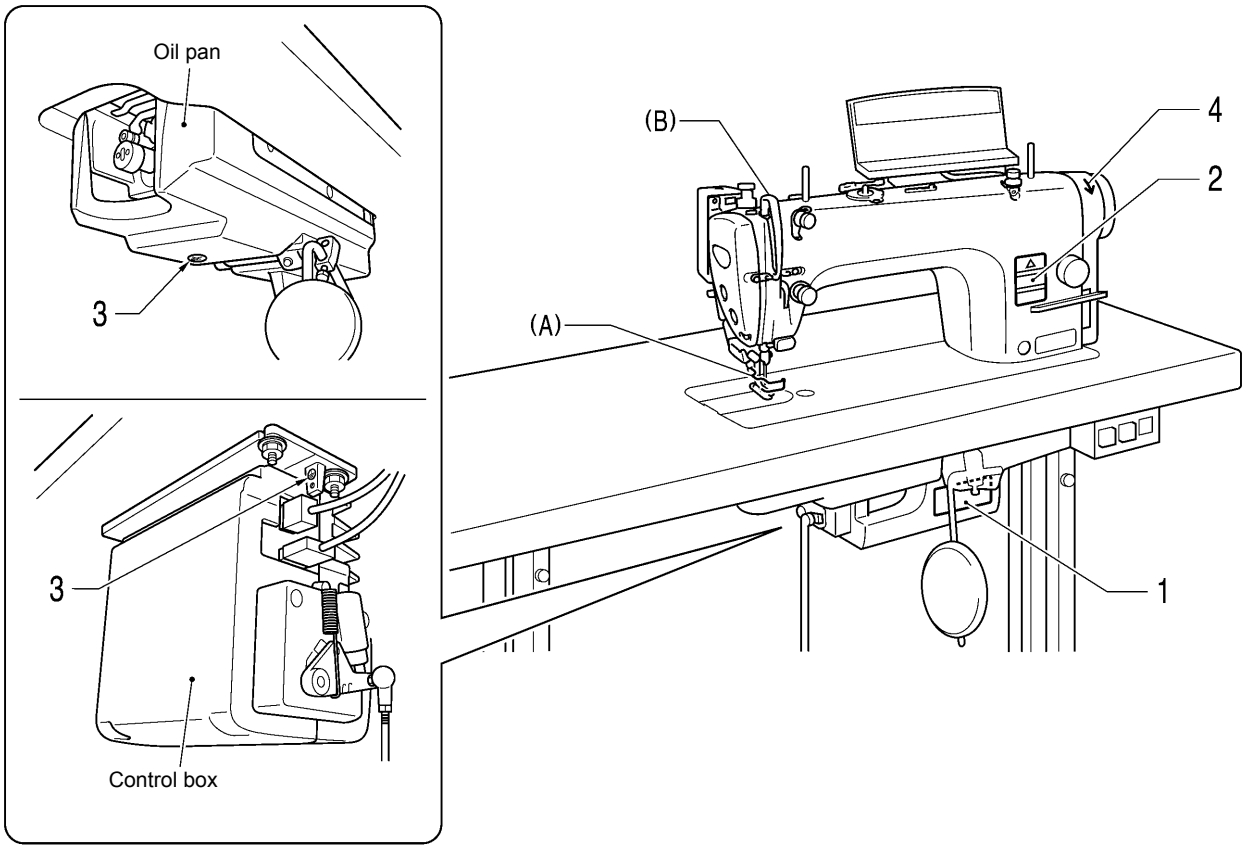
⚠ CAUTION

Moving parts may cause injury. Operate with safety devices. Turn off main switch before threading, changing bobbin and needle, cleaning etc.

3 Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.

4 Direction of operation

Safety devices:
(A) Finger guard
(B) Thread take-up cover



3629M

CONTENTS

1. MACHINE SPECIFICATIONS..... 1

2. NOTES ON HANDLING..... 2

3. FUNCTION SETTINGS (OPERATION PANEL) 3

3-1. Maximum sewing speed and start backtack sewing speed setting methods 3
3-2. Using the LOCK key 4
3-3. Setting the DIP switches 4
3-4. Setting functions 5
3-5. Function List 6
3-6. Clearing saved data (Initialization) 21

4. INITIALIZING THE CONTROL BOX PANEL 22

5. ADJUSTING THE ROTARY HOOK LUBRICATION AMOUNT (-[]0[], []3[] specifications) 23

6. ADJUSTMENTS 24

6-1. Adjusting the actuator position 24
6-2. Adjusting the safety switch position..... 25
6-3. Adjusting the thread take-up spring 26
6-4. Adjusting arm thread guide R..... 27
6-5. Adjusting the presser foot height..... 27
6-6. Adjusting of the feed dog height..... 28
6-7. Adjusting the feed dog angle..... 29
6-8. Adjusting the needle bar height..... 30
6-9. Adjusting the needle and feed mechanism timing.... 30
6-10. Adjusting the needle and rotary hook timing..... 31
6-11. Adjusting the thread trimming timing..... 32
6-12. Adjusting the thread take-up amount (-[][]3 specifications) 33
6-13. Adjusting the needle up stop position (When using the operation panel)..... 34
6-14. Setting the needle up stop position and needle down stop position (If using the control box panel) 35
6-15. Adjusting the treadle 37
6-16. Adjusting the presser foot floating amount (minute lifting amount) 37

7. REPLACING PARTS 38

7-1. Fixed knife..... 38
7-2. Movable knife 38
7-3. Motor and timing belt..... 39
7-4. Rotary hook RP..... 42
7-5. Feed bar shaft, Lifting feed shaft..... 43

8. APPLYING GREASE (-[]3[], []5[] specifications).....44

8-1. When using the operation panel..... 44
8-2. When using the control box panel 46

9. CONTROL SYSTEM.....48

10. CONTROL BOX AND MOTOR.....49

10-1. Removing and installing the control box 49
10-2. Control box and motor rating plate..... 50
10-3. Control circuit board..... 52
10-4. Checking the motor and power supply..... 54
10-5. Checking the solenoids..... 55

11. TREADLE UNIT ASSEMBLY 56

11-1. Types..... 56
11-2. Standard setting values 57
11-3. Setting method for standard depression strokes..... 58

12. STANDING OPERATION PEDAL 62

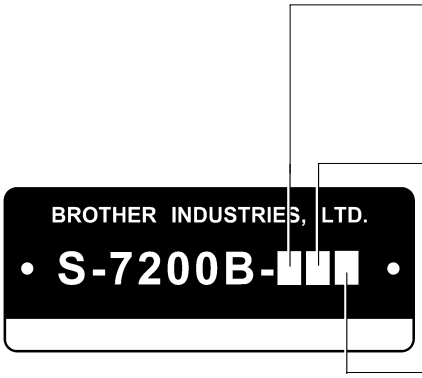
12-1. Installing the foot plug..... 62
12-2. Connectors 63

13. TROUBLESHOOTING.....64

13-1. Sewing..... 64
13-2. Error code displays 69

14. SEGMENT DISPLAY DEFINITION TABLE.....74

1. MACHINE SPECIFICATIONS



	3	4
Quick reverse	O	O
Thread wiper	-	O

	0	3	5
Lubrication type	Minimum lubrication	Semi dry	Complete dry

	S	3	5
Use	For light-weight and difficult-to-sew materials	For medium-weight materials	For heavy-weight materials

		-33S, -43S -45S	-453	-303, -403 -333, -433	-305 -405
Max. sewing speed		4,000 rpm		5,000 rpm*	4,500 rpm*
Start backtacking and continuous backtacking speed		220 - 3,000 rpm			
End backtacking speed		1,800 rpm			
Max. stitch length		4.2 mm	5 mm		
Presser foot height	Lifting lever	6 mm			
	Knee lifter	16 mm			
Feed dog height		0.8 mm			1.2 mm
Needle (DB×1, DP×5)		NS #9 - #11	#11 - #18		#19 - #22
Motor		AC servo motor (4-pole, 450W)			
Control circuit		Microprocessor			

*…When sewing at speeds of 4,000 rpm or higher, set the stitch length to 4.2 mm or less.

Rotary hook

-33S -43S	-303, -403 -333, -433	-305 -405	-45S -453
Lubricated / for light materials	Lubricated / for medium materials	Lubricated / for heavy materials	Rotary hook RP (lubrication-free rotary hook)

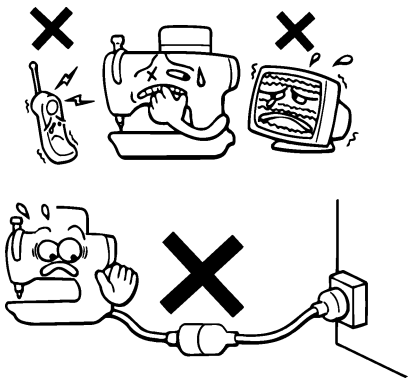
Lubricating oil

	-30[], -40[]	-33[], -43[]	-45[]
Rotary hook	High-speed spindle	High-speed spindle	-
Needle bar		Special Brother grease	Special Brother grease

2. NOTES ON HANDLING

About the machine set-up location

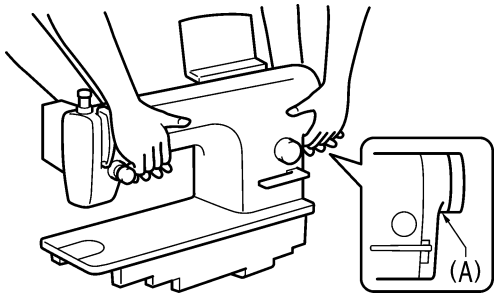
- Do not set up this sewing machine near other equipment such as televisions, radios or cordless telephones, otherwise such equipment may be affected by electronic interference from the sewing machine.
- The sewing machine should be plugged directly into an AC wall outlet. Operation problems may result if extension cords are used.



2086M

Carrying the machine

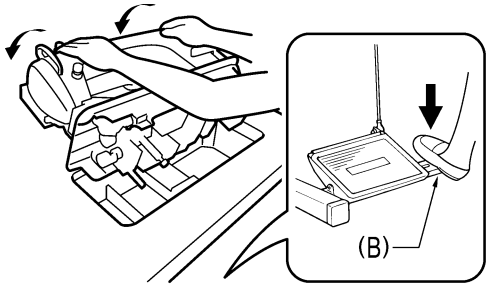
- The machine should be carried by the arm by two people as shown in the illustration.
  * Hold the motor cover (A) by hand also so that the pulley does not rotate.



2087M

Tilting back the machine head

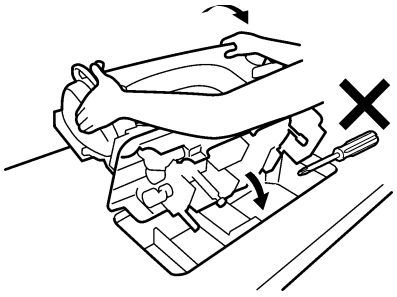
- Hold section (B) with your foot so that the table does not move, and then push the arm with both hands to tilt back the machine head.



2088M

Returning the machine head to the upright position

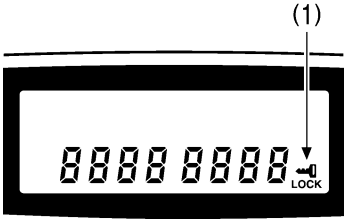
1. Clear away any tools, etc. which may be near the table holes.
2. While holding the face plate with your left hand, gently return the machine head to the upright position with your right hand.



2089M

3. FUNCTION SETTINGS (OPERATION PANEL)

3-1. Maximum sewing speed and start backtack sewing speed setting methods



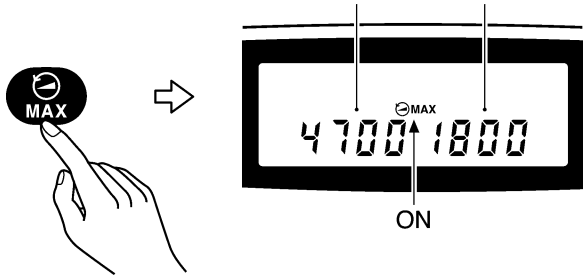
2232M

If the LOCK key icon (1) is on, release the lock before carrying out the following operations.

1

(Current setting)

Maximum sewing speed Start backtack sewing speed

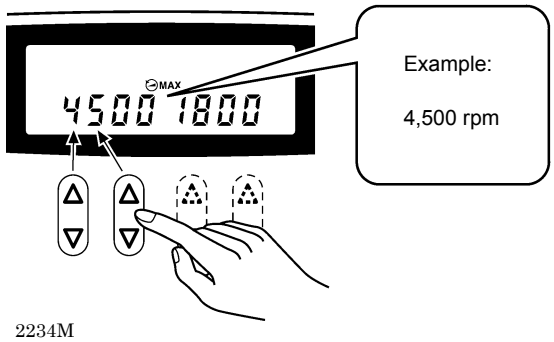


2233M

- The main display will change from an orange display to a green display.

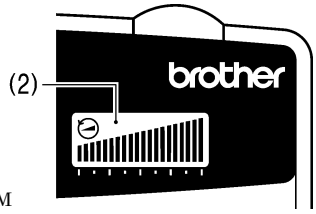
2

Maximum sewing speed setting



2234M

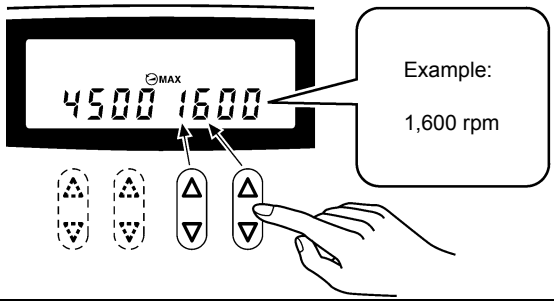
- The maximum sewing speed can be set to a speed from 220 rpm to the maximum sewing speed that has been set for the head detector unit.
- If all numbers in the sewing speed control display (2) are illuminated, sewing will be carried out at the maximum speed that is set here when the treadle is fully depressed.



2235M

3

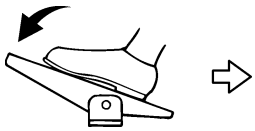
Start backtack sewing speed setting



2236M

- The start backtack sewing speed can be set to a speed from 220 rpm to 3,000 rpm.
  (The factory default setting is 1,800 rpm.)

4



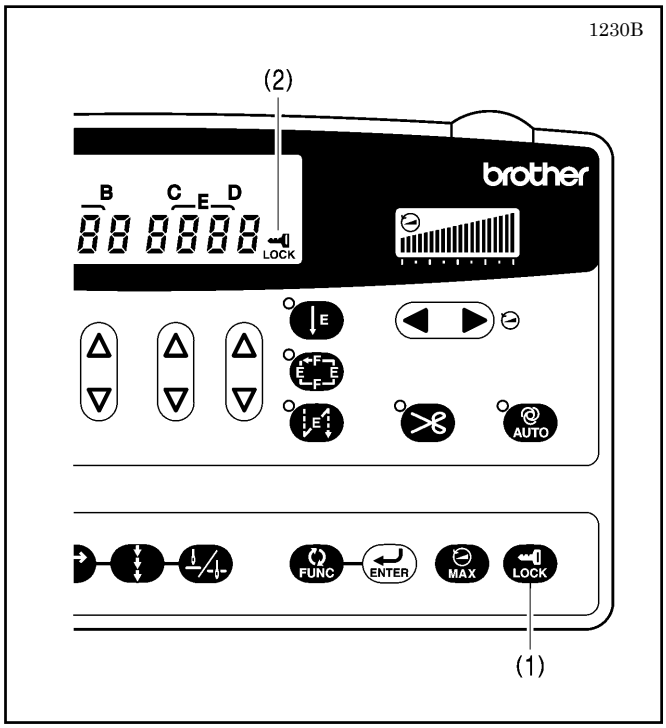
2159M

- When sewing starts, the sewing speed display disappears and returns to the orange display.

NOTE:

When the main display is green, normal key operations such as the start backtack key and the fixed stitch key cannot be used. Press the MAX key once more to clear the sewing speed display and return to the orange display. Normal key operations can then be carried out.

3-2. Using the LOCK key



When the power switch is turned on, the LOCK key (1) turns on. (The icon (2) is illuminated.)
The key operation that has been set using Function No. 101 will be disabled in order to prevent the accidental changing of settings.

Refer to “3-5. Function List” (P.17) for the available settings for Function No. 101.

<Releasing the lock>

Press down the LOCK key (1) for 2 seconds or more.
The icon (2) will switch off and the lock will be released.

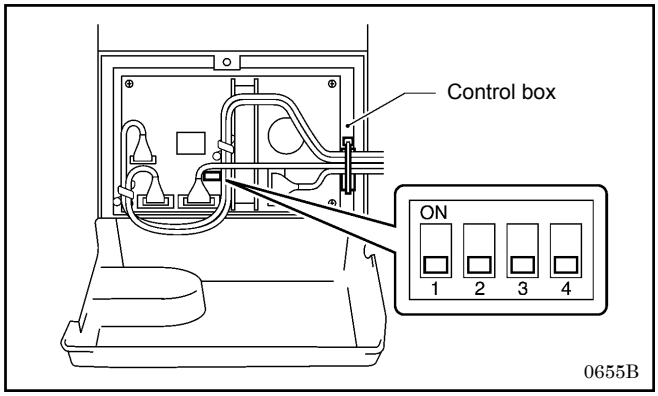
<Setting the lock>

When the icon (2) is switched off, press down the LOCK key (1) for 2 seconds or more.
The icon (2) will illuminate and the key operation that has been set using Function No. 101 will be disabled.

3-3. Setting the DIP switches

⚠ DANGER

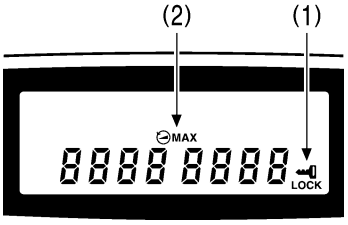
Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.



1	Presser foot position when the treadle is returned to the neutral position after thread trimming	ON	Presser foot is lowered. (Export specification)
		OFF	Presser foot is kept raised. (Japanese specification only) (See NOTE 1.)
2	Presser foot lowering when the treadle is depressed to step 1. (See NOTE 2)	ON	Enabled
		OFF	Disabled
3	Disabling the LOCK key	ON	The lock will not be released even if the LOCK key is pressed.
		OFF	Enabling or disabling of the key operation that has been set using Function No. 101 can be selected using the LOCK key.
4			Always set to off. (See NOTE 3.)

(NOTE 1) Once the knee lifter switch is used to lower the presser foot, the treadle can not be used to raise the presser foot while the machine is stopped; at this time, only the knee lifter is able to raise and lower the presser foot.
(NOTE 2) The treadle unit should also be adjusted when using this function. (Refer to page 56.)
(NOTE 3) When set to ON, treadle operation is disabled, so it should always be left at OFF.
If set to ON, the messages “d. P SW 4” (green) and “Err 101” (orange) will flash alternately in the display.

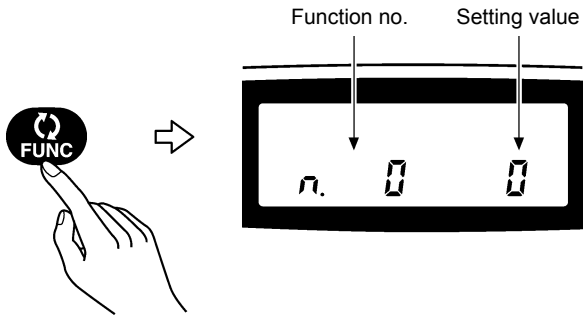
3-4. Setting functions



2238M

- If the LOCK key icon (1) is on, release the lock before carrying out the following operations.
- If the MAX key icon (2) is on, press the MAX key to return the main display to stitch number display (orange).

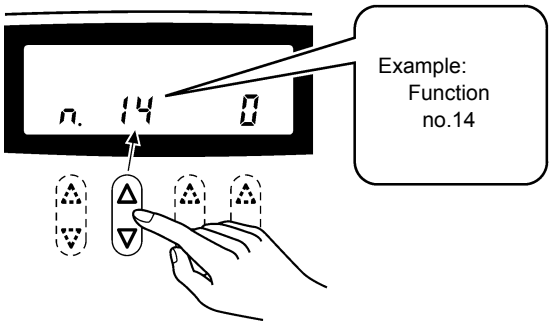
1



- The main display will change to green and function setting mode will be enabled.

2239M

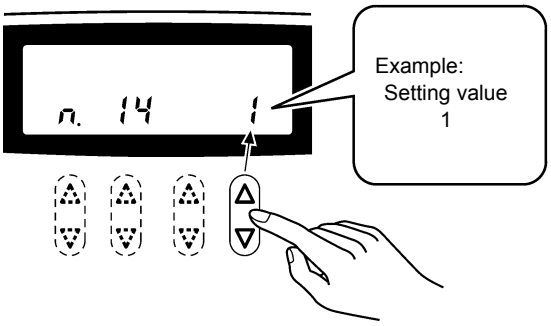
2 Selecting the function number



- Refer to the “Function List” to select the number for the function that you would like to change the setting for.

2240M

3 Changing the setting value



- Refer to the “Function List” to change the setting to a value within the setting range.

2241M

4

(Press for 2 seconds or more)

- The buzzer will sound for approximately 1 second, and then the setting will be accepted.
- The main display will return to the stitch number display (orange).

2242M

NOTE:

- If you depress the treadle before pressing the ENTER key, the main display will return to orange and the setting value will not be changed.
- If you change the function number after changing the setting value but before pressing the ENTER key, the setting value will not be changed.
  You need to press the ENTER key for each function number for the setting to be accepted.

3-5. Function List

Function No. 0 − 15

No.	Initial value	Setting range	Setting details
0	0 (degrees)	-10 – 20 (degrees)	Needle up stop position setting -10 ◄——— 0 ———► 20 Becomes higher Becomes lower 2243M
1	0 (degrees)	-10 – 10 (degrees)	Needle down stop position setting -10 ◄——— 0 ———► 10 Becomes lower Becomes higher 2244M
2	0	0 – 1	Depressing forward when depressed backward (thread trimming) 0: Disabled (depressing forward is enabled after returning to neutral position) 1: Enabled
3	1	0 – 1	Power supply voltage drop check (reset detection) function 0: Not used 1: Used; "Err 6" is displayed when a voltage drop occurs
4	0	0 – 1	Buzzer (electronic sound) for panel operation 0: Used 1: Not used
5	0	–	(Do not change this setting.)
6	0	0 – 1	Needle penetration up operation 0: Used 1: Not used
7	0	0 – 1	Backtack sewing speed 0: Limited by sewing speed control key 1: Not limited by sewing speed control key
9	0	0 – 1	End backtack sewing speed 0: Separate setting from start backtack sewing speed is possible 1: Setting for start backtack sewing is used
11 (NOTE 1)	0	0 – 4	Option actuator operation setting 0: Half stitch correction sewing 1: Single stitch correction sewing 2: Single reverse stitch correction sewing (reverse feed) 3: Thread trimming 4: Single end backtack cycle cancel 5: Solenoid-type presser foot lifter is raised (Alternating*) 6: Solenoid-type presser foot lifter is raised (Momentary*)
12	0	0 – 1	Presser foot status when treadle is returned to neutral after thread trimming 0: Presser foot drops (See NOTE 2) 1: Presser foot does not drop
13	0	0 – 1	Presser foot status after treadle stops at neutral 0: Presser foot does not lift 1: Presser foot lifts
14	0	0 – 1	Actuator function 0: Reverse stitch switch during operation, correction sewing switch when stopped 1: Thread trimming switch
15	0	0 – 1	Slow stop control when treadle is returned to neutral 0: Slow stop control without step operation 1: Above control is not used

(NOTE 1) If function No. 69 is set to “3”, operation is enabled.

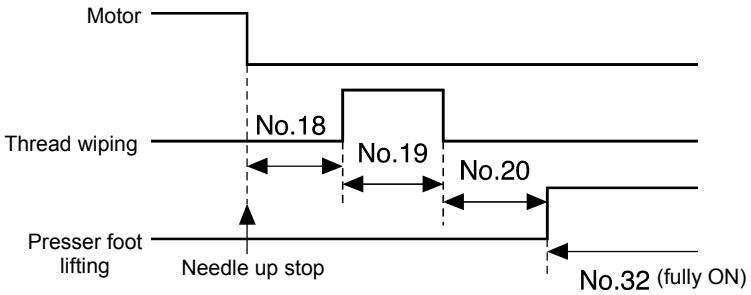
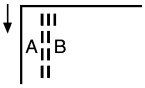
(NOTE 2) Presser foot will not drop if DIP switch 1 is set to OFF.

*… Enabled if the control box model is MD-741A/751A.

(Alternating): The presser foot is raised or lowered each time the optional actuator is pressed.

(Momentary): The presser foot is raised only while the optional actuator is being pressed.

Function No. 16 − 28

No.	Initial value	Setting range	Setting details
16	3 (minutes)	0 – 30 (minutes)	Overtime function 0: Not used 1–30: Machine stops after continuous operation for set time, and "Err 8" is displayed.
17	0	0 – 2	Correction sewing function (See NOTE 3) 0: Half stitch correction sewing/Single stitch correction sewing 1: No correction sewing/Single stitch correction sewing 2: Reverse stitch (reverse feed) correction sewing/Single stitch correction sewing
18	20 (ms)	10 – 200 (ms)	Thread wiping and presser foot lift operation timing after thread trimming 2245M 
19	50 (ms)	10 – 200 (ms)	
20	50 (ms)	10 – 200 (ms)	
21	0	0 – 1	Start backtack sewing operation 0: Stitch number A, B (N stop) 1: Stitch number A, B, A, B (N stop double)
22	0	0 – 1	End backtack sewing operation 0: Stitch number C, D 1: Stitch number C, D, C, D (N stop double)
23 (NOTE 4)	0 (stitches)	0 – 99 (stitches)	Stitch number G
24 (NOTE 5)	0 (stitches)	0 – 99 (stitches)	Stitch number H
25 (NOTE 6)	0 (stitches)	0 – 99 (stitches)	Stitch number I
26	0	0 – 1	Speed for moving to end backtack 0: Decelerates to low speed, then end backtacking starts 1: Decelerates to end backtacking speed, then end backtacking starts (Cycle time can be shortened.)
27	0	0 – 1	Continuous backtacking operation 0: Stitch number A, B, C, D 1: Stitch number A, B x D times
28	0	0 – 1	Feed direction when stopping immediately after start backtacking 0: Quick reverse solenoid turns off and stops in normal feed direction  1: After stopping, quick reverse solenoid turns OFF (See NOTE 7) 2246M

(NOTE 3) The setting to the left of the " / " symbol is when the correction stitch icon is off, and the setting to the right is when the correction stitch icon is on.
Turn the power off and back on again when this setting is changed. The setting will be enabled after the power turns back on.

(NOTE 4) Stitch number setting is enabled when Function No. 118 is set from "1" to "3".

(NOTE 5) Stitch number setting is enabled when Function No. 118 is set to "2" or "3".

(NOTE 6) Stitch number setting is enabled when Function No. 118 is set to "3".

(NOTE 7) Operates when treadle is lightly pressed when Function No. 31 is set to "0".

Function No. 29 − 40

No.	Initial value	Setting range	Setting details
29*	0	0 – 3	Actuator function while sewing machine is stopped 0: None 1: Solenoid-type presser foot lifter is raised (alternating**) 2: Solenoid-type presser foot lifter is raised (momentary**) 3: Quick reverse mechanism operates
30	150 (ms)	0 – 500 (ms)	Delay time until motor starts operating when using automatic presser lifter and the presser foot is raised when sewing starts
31	0	0 – 1	Stopping during start backtacking and speed during start backtacking 0: When treadle is returned to neutral, start backtacking finishes and then operation stops, and the speed is the start backtacking (constant) speed 1: When treadle is returned to neutral, stopping is possible while start backtacking is in progress, and the start backtacking speed corresponds to the treadle depression amount (low speed up to start backtacking speed)
32	300 (ms)	10 − 990 (ms)	Presser foot lifter solenoid fully ON time
33	0	0 – 1	Operation during pleat sewing setting 0: Reverse sewing operation when actuator switch is ON 1: Fixed stitch sewing operation when actuator switch is ON (fixed stitch sewing recall function)
34	0 or 1	0 – 1	[Do not change this setting]
35	0	0 – 1	Presser foot soft down mode 0: Automatic mode (See NOTE 8) 1: Manual mode (See NOTE 9)
36	180 (seconds) (3 minutes)	0 – 240 (seconds)	Presser foot lift time 0: No timer function (does not drop) 1−240: Presser foot drops after set time
37	0	0 – 1	Automatic presser foot lifter type 0: Solenoid type (See NOTE 10) 1: Pneumatic type (See NOTE 11)
38 (NOTE 12)	40 (ms)	20 – 120 (ms)	Delay time for presser foot lifter solenoid to turn on after presser foot drop command
39 (NOTE 13)	12	10 – 12	Voltage detection constant for presser foot lifter solenoid to turn on after presser foot drop command
40	0	0 – 1	Operation after knee switch is used to raise and lower presser foot (See NOTE 14) 0: Presser foot cannot be raised and lowered by depressing the treadle backward 1: Above operation is possible

(NOTE 8) Adjustment of Function No. 39 is necessary.

(NOTE 9) Adjustment of Function No. 38 is necessary.

(NOTE 10) Duty during chopping can be changed using Function No. 115.

(NOTE 11) Duty during chopping can be changed using Function No. 116.

(NOTE 12) Only enabled when Function No. 35 is set to “1”.

(NOTE 13) Only enabled when Function No. 35 is set to “0”. If set to “10”, response is fastest and operating noise is greatest.

(NOTE 14) Setting is only enabled when DIP switch 1 is set to OFF.

*… Enabled if the control box model is MD-741A/ 751A.

**… (Alternating): The presser foot is raised or lowered each time the optional actuator is pressed.
(Momentary): The presser foot is raised only while the optional actuator is being pressed.

Function No. 41 − 55

No.	Initial value	Setting range	Setting details
41	0	0 – 1	Presser foot lifting when treadle is depressed backward to 1st step after returning to neutral 0: Possible 1: Not possible
42	0	0 – 1	Operation when treadle is depressed backward 0: Thread trimming operation 1: Thread trimming operation disabled (presser foot is raised when treadle is depressed backward)
43	0	0 – 1	Depressed backward operation after treadle is returned to neutral and needle stops in the up position 0: Single stitch is sewn and then the thread is trimmed (lock stitchers) 1: Thread wiping operation when needle is stopped in up position (chain stitchers)
44	0	0 – 1	Operation when Standing operation variable speed pedal is on 0: Sewing speed corresponds to treadle depression amount 1: Sewing speed corresponds to sewing speed control key setting (constant speed)
45	80 (ms)	0 – 500 (ms)	Delay time from standing pedal turning on until motor starts operating
46	0	0 – 1	Operation during standing operation when AUTO function is on 0: Sewing pauses when presser foot lifter pedal is on (operation pause) 1: Above function is not used
47	0	0 – 1	Operation during standing operation when AUTO function is on 0: Operation stops when high speed pedal turns back on, and restarts when off 1: Above function is not used
48	0	0 – 1	Thread trimming pedal function after thread trimming during standing operation 0: Presser foot can be raised and lowered 1: Above operation not used (only possible using presser foot lifter pedal)
49	0	0 – 1	Alternate standing operation pedal and treadle operation (See NOTE 15) 0: Treadle operation is disabled after standing operation pedal is used 1: Treadle operation can also be used after standing operation pedal is used (alternate operation is possible)
50	4000 (rpm)	300 – 5000 (rpm)	Automatic deceleration speed when quick reverse mechanism has been operated using the actuator switch
51*	0	0 – 1	Correction stitch sewing using actuator switch after thread trimming 0: Not possible (switch operation disabled) 1: Possible
52	2 (needles)	1 – 99 (needles)	Number of slow start stitches
53*	10 (needles)	0 – 100 (needles)	Count units for stitch counter display 0: No counting operation 1–100: Display counts down by number of stitches set
54*	1	0 – 2	Operation when stitch counter warning occurs (“!” icon is illuminated) 0: Starting using treadle is enabled as normal 1: Starting using treadle is disabled (thread trimming by depressing treadle backward is possible) 2: Starting using treadle is completely disabled once treadle is returned to neutral and operation stops
55 (NOTE 16)	0	0 – 1	Operation after treadle is depressed backward or knee switch is operated when presser foot is raised 0: When treadle is returned to neutral, presser foot is raised 1: When treadle is returned to neutral, presser foot is lowered

(NOTE 15) Presser foot lifter pedal operation is not included. In the case of simultaneous operation, the standing operation pedal takes priority.

(NOTE 16) Setting is only enabled when DIP switch 1 is set to ON.

*… Settings indicated with " * " are enabled when the power is turned off and then back on.

Function No. 56 − 60

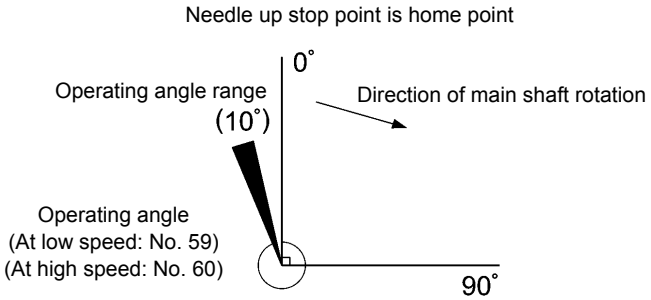
No.	Initial value	Setting range	Setting details
56	0	0 – 1	Function for preventing needle bar operation when treadle is accidentally depressed forward when it is returned to neutral after being depressed backward 0: Used 1: Not used
57 (NOTE 17)	0	0 – 1	Operation when treadle is depressed forward to 1st step when presser foot is raised 0: Presser foot is lowered 1: Presser foot is not lowered
58	2	0 – 2	Synchronization function when quick reverse mechanism has been operated using the actuator switch 0: Disabled 1: Only quick reverse mechanism synchronization enabled 2: Synchronization of main shaft at automatic deceleration speed set by No. 50
59	0 (degrees)	0 – 355 (degrees)	[Do not change this setting]
60	150 (degrees)	0 – 355 (degrees)	[Do not change this setting]

(NOTE 17) Setting is only enabled when DIP switch 2 is set to ON.

<Needle breakage prevention function specifications>

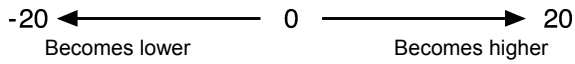
* Use Function No. 50 to set the automatic deceleration speed when the quick reverse mechanism has been operated using the actuator switch.(Setting possible in units of 100 rpm)
* Use Function No. 58 to set the synchronization function when the quick reverse mechanism has been operated using the actuator switch.

(Example) Default settings: At low speed: 0°; At high speed: 150°



0654B

Function No. 61 − 68

No.	Initial value	Setting range	Setting details
61	0	0 – 1	Highest needle position stop operation 0: Not used 1: Used
62 (NOTE 18)	0	0 – 1	Thread wiping operation during highest needle position stop operation 0: Thread wiping occurs after needle stops in highest position 1: Thread wiping occurs after thread trimming, and then needle bar is raised
63	0	0 – 1	Thread trimming timer operation 0: Not used (Thread trimming is off when needle bar is stopped at the up position) 1: Used (Time is set using Function No. 73)
64	0	0 – 2	0: Standard 1: Not used 2: Twin needle lock stitcher (T-8422A-[][]3) [Do not change this setting]
65 (NOTE 18)	150 (ms)	10 – 500 (ms)	Delay time until reverse operation starts during highest needle position stop operation
66 (NOTE 18)	0	0 – 1	Presser foot lift timing during highest needle position stop operation 0: Presser foot is raised after needle bar is raised 1: Presser foot is raised before needle bar lift operation starts (See NOTE 19)
67 (NOTE 18)	0 (degrees)	-20 – 20 (degrees)	Highest needle position stop position setting 
68 (NOTE 20)	0	0 – 1	Seam matching function during automatic backtacking 0: Operation does not stop when switching cloth feed direction 1: Operation momentarily stops when switching cloth feed direction

(NOTE 18) Setting is enabled when Function No. 61 is set to “1”.

(NOTE 19) Operation is disabled when Function No. 62 is set to “1”. Presser foot is raised after needle bar is raised.

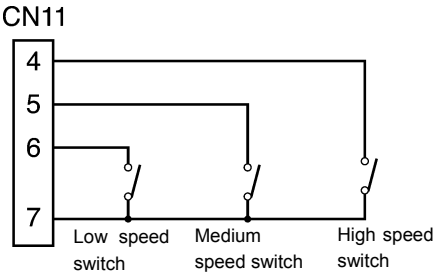
(NOTE 20) Used when you would like to match the seam accurately during automatic backtacking. Use Function No. 78 to set the stop position and Function No. 79 to change the time before restarting.

Function No. 69

No.	Initial value	Setting range	Setting details
69	0	0 – 3	Actuator (option) function 0: No function (1: Stitch counter actuator) 2: Sewing speed actuator 3: Option actuator

<When set as a sewing speed actuator>

Connect the switches to connector CN11 on the control circuit board.

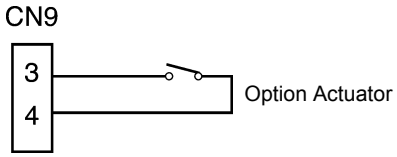


2250M

- When the low speed switch is pressed, the sewing speed becomes 1,000 rpm. The speed can be changed by setting Function No. 122.
- When the medium speed switch is pressed, the sewing speed becomes 3,000 rpm. The speed can be changed by setting Function No. 121.
- When the high speed switch is pressed, the sewing speed returns to the maximum sewing speed that has been set using the MAX key.

<When set as an option actuator>

Connect to connector CN9 on the control circuit board.



2251M

- Set the operation using Function No. 11.

Function No. 70 − 72

No.	Initial value	Setting range	Setting details
70 (NOTE 21)	6	0 – 6	Option output setting 0: Puller 1: Needle cooler (synchronized output during operation) 2: Air saving 3: Condense 4: Chain stitch thread trimming (thread wiping) 5: Pneumatic wiper 6: No output
71 (NOTE 22)	0 (needles)	0 – 99 (needles)	Number of stitches from sewing start until puller is lowered 0: Synchronized with presser foot lifter operation 1 − 99: Puller is lowered after the set number of stitches is sewn
72 (NOTE 22)	10 (seconds)	5 – 30 (seconds)	Time until puller is lowered

(NOTE 21) The factory default setting is for no output, so the output must be set. Output is from pins 2–4 of connector CN15 on the control circuit board.

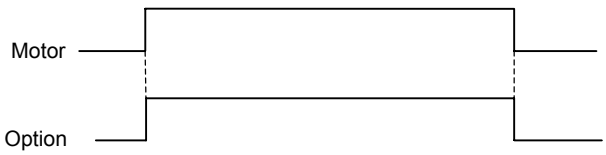
(NOTE 22) Setting is enabled when Function No. 70 is set to “0”.

<When set to puller>

- When the sewing machine is stopped, the puller is lowered after 10 seconds in synchronization with the automatic presser foot lifter.
- During sewing, the puller is only raised when the reverse mechanism operates.
- The time of 10 seconds can be changed by setting Function No. 72.
- Function No. 71 can be used to set the number of stitches until the puller is lowered after sewing starts. If the puller is raised (in synchronization with the automatic presser foot lifter) while the sewing machine is stopped after thread trimming, this operation occurs.

<When set to needle cooler (synchronized output during operation)>

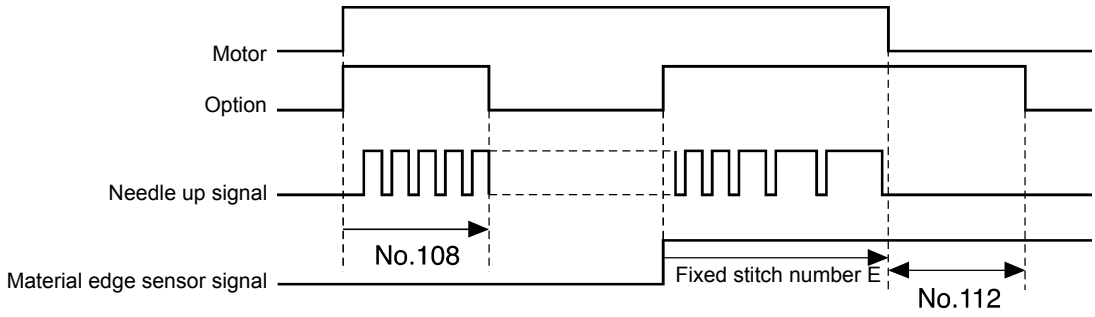
- Output is synchronized with motor operation.



2252M

<When set to air saving>

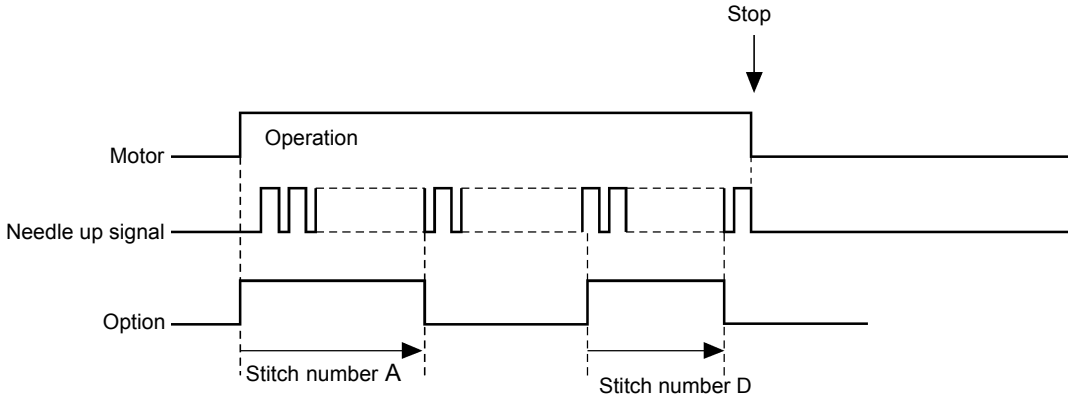
- Output only occurs at the sewing start and the sewing end. A material edge sensor (S2) is required for output at the sewing end.
- Function No. 108 is used to set the number of stitches at the sewing start. Output only occurs while the number of stitches set are being sewed after sewing starts.
- The number of stitches at the sewing end is set by fixed stitch number E at the operation panel. Output occurs when the edge of the material is detected.
- The delay time after thread trimming until output turns off is set using Function No. 112. If the needle stops in the down position after the edge of the material is detected, output turns off when the needle stops.



2253M

<When set to condense>

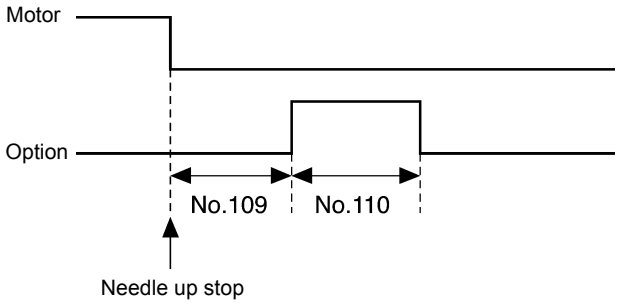
- Start backtacking or end backtacking must be set.
- For the sewing start, set stitch number B to “0”. Output will occur while stitches for stitch number A are being sewn.
- For the sewing end, set stitch number C to “0”. Output will occur while stitches for stitch number D are being sewn.



2254M

<When set to chain stitch thread trimming (thread wiping)>

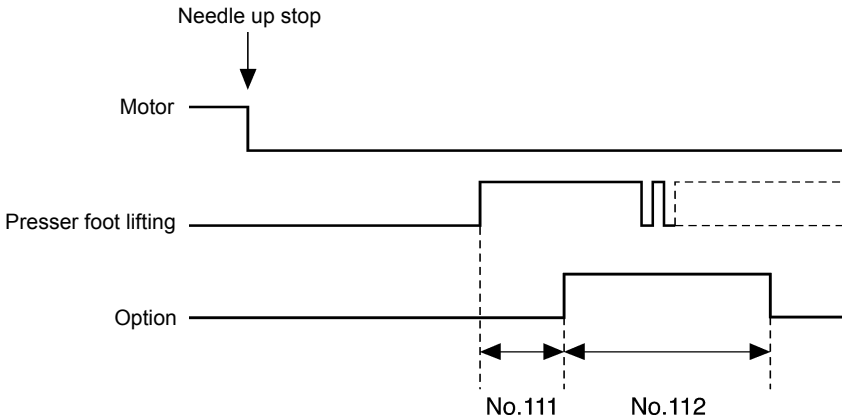
- After thread trimming, the thread wiper signal is output.
- Use Function No. 109 and No. 110 to set the timer operation.



2255M

<When set to pneumatic wiper>

- After thread trimming, output is synchronized with the automatic presser foot lifter.
- Use Function No. 111 and No. 112 to set the timer operation.
- When the presser foot is lowered, option output turns off.



2256M

Function No. 73 − 79

No.	Initial value	Setting range	Setting details
73 (NOTE 23)	90 (ms)	50 – 150 (ms)	Thread trimming on time
74	15 degrees	-345 – 345 (degrees)	Quick reverse solenoid on timing during start backtacking/continuous backtacking
75	-30 degrees	-345 – 345 (degrees)	Quick reverse solenoid off timing during start backtacking/continuous backtacking
76	-30 degrees	-345 – 345 (degrees)	Quick reverse solenoid off timing during end backtacking
77 (NOTE 24)	15 degrees	-345 – 345 (degrees)	Quick reverse solenoid on timing during end backtacking
78 (NOTE 25)	180 (degrees)	0 – 350 (degrees)	Pause position when switching feed direction
79 (NOTE 26)	100 (ms)	10 – 500 (ms)	Pause time when switching feed direction

(NOTE 23) Setting is enabled when Function No. 63 is set to “1”.

(NOTE 24) Setting is enabled when Function No. 22 or No. 26 is set to “1”.

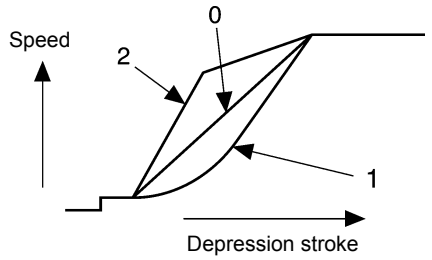
(NOTE 25) Setting is enabled when Function No. 68 is set to “1”. The stopping position is the angle after the need up signal turns on.

(NOTE 26) Setting is enabled when Function No. 68 is set to “1”. The reverse feed mechanism switches at the stopping position.
When the stopping time has elapsed, the sewing machine restarts automatically.

<Settings for Function Nos. 74 − 77>

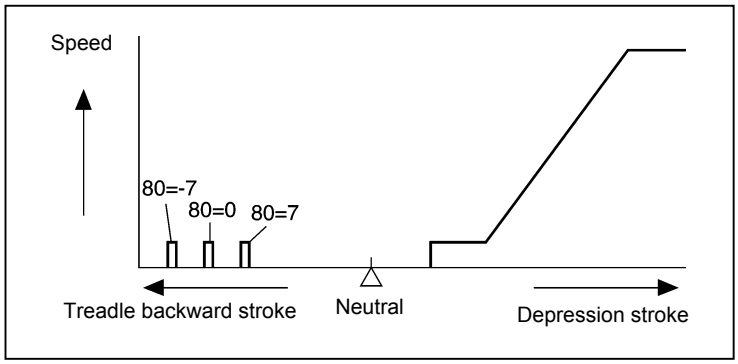
- If the values are set to values that are less than the initial value (- direction), the quick reverse solenoid on/off timing becomes faster. If the seam length immediately before switching occurs is short, change the setting to a value in the - direction.
- If the values are set to values that are greater than the initial value (+ direction), the quick reverse solenoid on/off timing becomes slower. If the seam length immediately after switching occurs is short, change the setting to a value in the + direction.

Function No.80 − 88

No.	Initial value	Setting range	Setting details
80*	0	-7 – 7	Treadle backward on (thread trimming) point
81*	0	-5 – 5	Treadle backward 1st step on (presser foot lifting) point
82*	0	-5 – 5	Treadle forward 1st step on (presser foot dropping) point
83*	0	-5 – 5	Treadle forward on (starting) point
84*	0	-5 – 5	Treadle variable speed range starting point
85*	0	-6 – 6	Treadle high speed range reaching point
86*	0	-2 – 2	Variable speed range starting point for standing operation variable speed pedal
87*	0	-2 – 2	High speed range reaching point for standing operation variable speed pedal
88*	0	0 – 2	Treadle speed curve 0: Constant 1: Curves downward 2: Curves upward  2257M

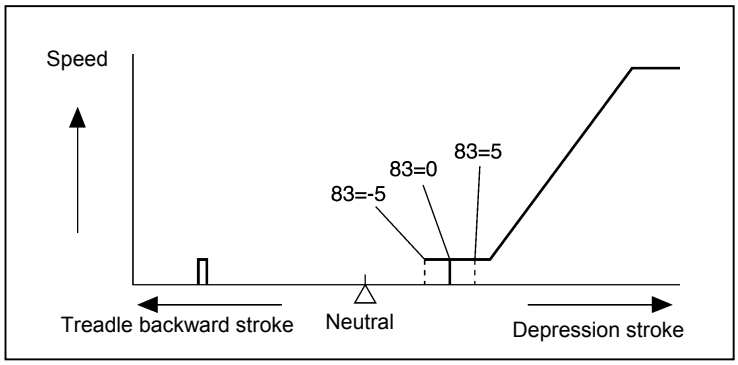
*… Settings indicated with " * " are enabled when the power is turned off and then back on.

With the treadle neutral position as the 0 point, the values in the forward direction are + (plus) values, and those in the backward direction are - (minus) values, so that the speeds accelerate or decelerate around the standard setting.
(Refer to page 57 for details.)



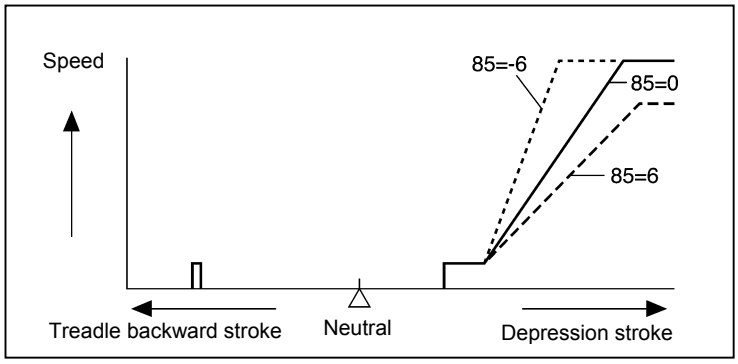
(ex. 1) Setting for Function No. 80

2258M



(ex. 2) Setting for Function No. 83

2259M



(ex. 3) Setting for Function No. 85

2260M

Function No. 90 − 107

No.	Initial value	Setting range	Setting details
90	220 (rpm)	150 – 300 (rpm)	Thread trimming speed (TRIM)
91	220 (rpm)	150 – 300 (rpm)	Low speed (INCH)
92	1400 (rpm)	500 – 2,500 (rpm)	Stop improvement speed (POS) [Do not change this setting.]
93	700 (rpm)	INCH – 1,000 (rpm)	Slow speed (SLOW)
94	3,000 (rpm)	INCH – 3,000 (rpm)	Start backtacking limit speed (SBL) (See NOTE 27)
96	1,800 (rpm)	INCH – 3,000 (rpm)	End backtacking speed (EBT)
98	HIL (rpm)	INCH – HIL (rpm)	Automatic speed (AUTO)
99	(NOTE 28)	INCH – 5,000 (rpm)	Maximum sewing speed limit speed (HIL) (See NOTE 29)
101	1	0 – 3	Lock level for operation panel lock 0: FUNC key 1: FUNC key + MAX key 2: FUNC key + MAX key + Correction key 3: FUNC key + MAX key + Correction key + Stitch number key
102	0	–	[Do not change this setting]
103	0 (needles)	0 – 99 (needles)	No. of pocket sewing stitches J
104	0 (needles)	0 – 99 (needles)	No. of pocket sewing stitches K
105	0 (needles)	0 – 99 (needles)	No. of pocket sewing stitches L
106	0 (needles)	0 – 99 (needles)	No. of pocket sewing stitches M
107	0	–	[Do not change this setting]

(NOTE 27) This is the upper limit for the start backtacking speed setting. Refer to page 3 for details on start backtacking speed settings.

(NOTE 28) This setting is read from the head detector unit.

(NOTE 29) This is the upper limit for the maximum sewing speed setting. Refer to page 3 for details on maximum sewing speed settings.

Function No. 108 − 114

No.	Initial value	Setting range	Setting details
108 (NOTE 30)	0 (needles)	0 – 99 (needles)	Number of stitches for option output (C1)
109 (NOTE 31)	10 (ms)	0 – 990 (ms)	Delay time until option output turns on (C2)
110 (NOTE 31)	0 (ms)	0 – 990 (ms)	Option output on time (C3)
111 (NOTE 32)	0 (ms)	0 – 990 (ms)	Delay time until option output turns on (C4)
112 (NOTE 33)	2000 (ms)	0 – 9900 (ms)	Option output on time (C5)
113 (NOTE 34)	0 (needles)	0 – 99 (needles)	Number of stitches for option output (C6)
114 (NOTE 34)	0 (needles)	0 – 99 (needles)	Number of stitches for option output (C7)

(NOTE 30) Setting is enabled when Function No. 70 is set to “2”.

(NOTE 31) Setting is enabled when Function No. 70 is set to “4”.

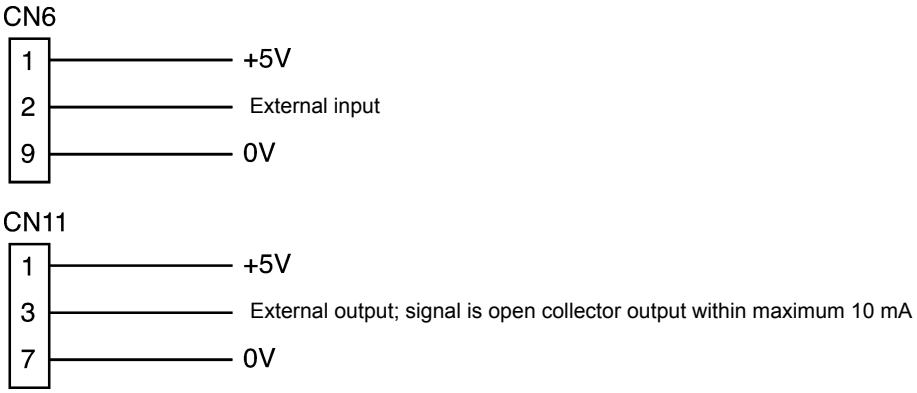
(NOTE 32) Setting is enabled when Function No. 70 is set to “5”.

(NOTE 33) Setting is enabled when Function No. 70 is set to “2” or “5”.

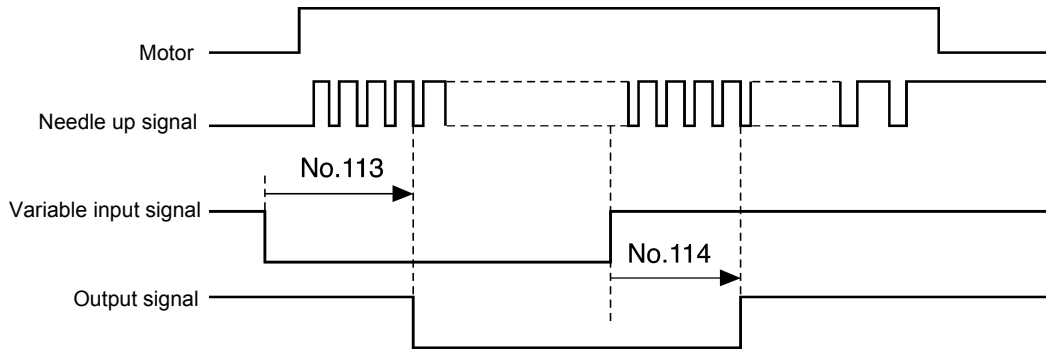
(NOTE 34) The stitch number control output signal can be set in accordance with the variable input signal.

<Stitch number control output signal>

The variable input signal should be connected to connector CN6. The output signal is sent to connector CN11.



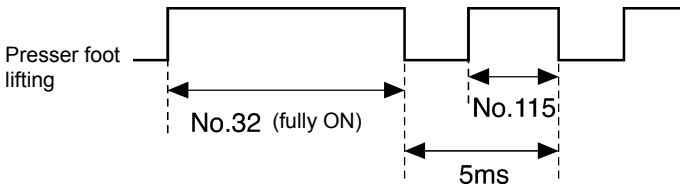
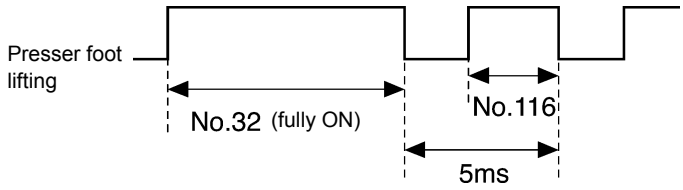
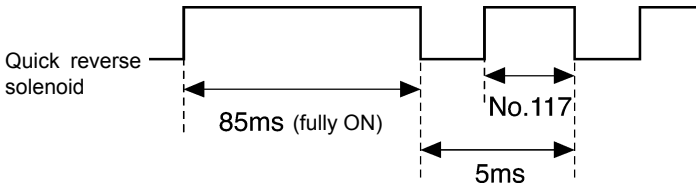
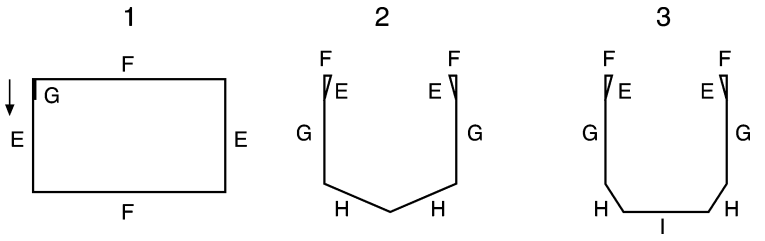
2262M



2263M

NOTE: If Function No. 112 and No. 113 are set to “0”, output is synchronized with the variable input signal.

Function No. 115 − 118

No.	Initial value	Setting range	Setting details
115 (NOTE 35)	10 (1.0 ms)	1 – 49 0.1 – 4.9 (ms)	On time when solenoid-type presser lifter solenoid is chopping  2264M
116 (NOTE 36)	25 (2.5 ms)	1– 49 (0.1 – 4.9 ms)	On time when pneumatic-type presser lifter solenoid is chopping  2265M
117	11 (1.1 ms)	1 – 49 (0.1 – 4.9 ms)	On time when quick reverse solenoid is chopping  2266M
118 (NOTE 37)	0	0 – 6	Sewing pattern setting when name label key is on 0: E–F–E–F (Name label attaching) 1: E–F–E–F–G 2: E–F–G–H–H–G–F–E (Pocket sewing 1) 3: E–F–G–H–I–H–G–F–E (Pocket sewing 2) 4: E–F–G–H–I–I–H–G–F–E 5: E–F–G–H–I–J–I–H–G–F–E 6: E–F–G–H–I–J–K–L–M  2267M

(NOTE 35) Setting is enabled when Function No. 37 is set to “0”.

(NOTE 36) Setting is enabled when Function No. 37 is set to “1”.

(NOTE 37) When set to “1”, stitch number G is set for function No. 23.
When set to “2”, stitch number G is set for function No. 23 and stitch number H is set for Function No. 24.
When set to “3”, stitch number G is set for function No. 23, stitch number H is set for Function No. 24 and stitch number I is set for Function No. 25.
This step is skipped if the number of stitches is zero.

Function No. 119 − 131

No.	Initial value	Setting range	Setting details
119	3	–	[Do not change this setting.]
120	5	–	[Do not change this setting.]
121 (NOTE 38)	3000 (rpm)	200 – 5000 (rpm)	Speed when medium speed switch is on
122 (NOTE 38)	1000 (rpm)	200 – 5000 (rpm)	Speed when low speed switch is on
123	45 (degrees)	30 – 90 (degrees)	Servo lock release angle (Do not change this setting.)
124*	0	0 – 1	Material edge sensor logic selection 0: Detects material absent 1: Detects material present
125	0	0 – 1	Servo lock operation 0: None 1: When stopped 2: When presser foot lifting signal is on
126	1 (seconds)	0 – 120 (seconds)	Servo lock timer setting 0: No timer operation 1–120: Timer operates (1–120 seconds)
127	100	–	[Do not change this setting.]
128	0	0 – 3	Flicker reduction function (when flickering occurs from fluorescent light) 0: None 1: Medium flicker reduction 2: Low flicker reduction 3: High flicker reduction 4: [Do not use this setting, otherwise the motor will overheat.]
129	0	-2 – 2	Motor acceleration gain [Do not change this setting.]
130	0	-2 – 2	Motor deceleration gain [Do not change this setting.]
131	–	–	[Do not change this setting.]

(NOTE 38) Setting is enabled when Function No. 69 is set to “2”.

*… Settings indicated with “ * “ are enabled when the power is turned off and then back on.

Function No.132 − 136

The following function numbers show maintenance information.

No.	Description of displays
132	Cumulative power on time (Actual time = Displayed time x 10)
133	Cumulative operating time (Actual time = Displayed time xxxx x 10)
134	Cumulative grease-up running time (Time = Display xxxx x 1 hour) / Grease life estimate (%)
135	ROM version (x.xxx)
136	Set maximum speed history (rpm)

3-6. Clearing saved data (Initialization)

<Types of data that are cleared>

When saved data is cleared, the following data are returned to factory default settings.

- All data that has been set using the operation panel (including function setting data)

<Initializing the data>

Initializing all data

1. While pressing the RESET key on the operation panel, turn on the power switch.
   The main display will change to orange and “iniT ALL” will be displayed.
2. Press the ENTER key.
   Initialization will be carried out and the “iniT ALL” display will change to green.
3. After this, the operation panel and the treadle can be operated. When an operation is carried out, the display will return to the normal display.

Initializing only speed data

1. While pressing the MAX key on the operation panel, turn on the power switch.
   The main display will change to orange and “iniT rPM” will be displayed.
2. Press the ENTER key.
   The speed data will be initialized to the speed data from the head detector unit and the “iniT rPM” display will change to green.
3. After this, the operation panel and the treadle can be operated. When an operation is carried out, the display will return to the normal display.

Initializing only the function setting data

1. While pressing the FUNC key on the operation panel, turn on the power switch.
   The main display will change to orange and “iniT FunC” will be displayed.
2. Press the ENTER key.
   Initialization of the function setting data will be carried out and the “iniT FunC” display will change to green.
3. After this, the operation panel and the treadle can be operated. When an operation is carried out, the display will return to the normal display.

<Clearing data automatically>

When the power is turned on for the first time, the treadle and the operation panel cannot be operated for a period of approximately 4 seconds.
After approximately 4 seconds, the main display will change to green and “init rPM” will be displayed. “iniT rPM” means that the sewing machine's speed settings have been initialized.
In addition, this display will also appear in the following cases approximately 4 seconds after the power has been turned on.

- When the control box has been replaced
- When a sewing machine with different speed specifications to the control box is connected

NOTE:

When the power switch is turned on, any of the sewing machine's sewing speeds that are different from the setting data in the head detector unit are reset automatically.
When initialization is complete, the main display will change to green and “init rPM” will be displayed.
After this, the operation panel and the treadle can be operated. When an operation is carried out, the display will return to the normal display.

4. INITIALIZING THE CONTROL BOX PANEL

This returns the control box panel settings to the factory default settings.

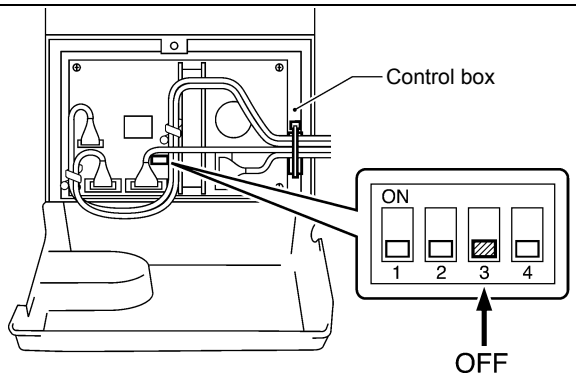
NOTE:

The control box panel will not operate when the machine head operation panel is connected.

⚠ DANGER

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

1

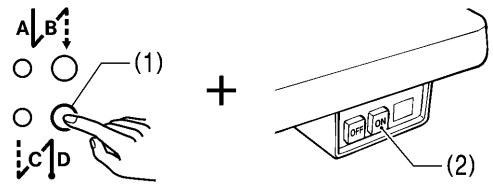


3143M

Set DIP switch -3 to OFF.

(This will cancel the lock so that the functions can be set.)

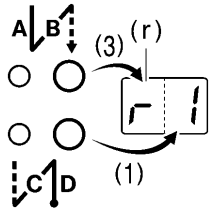
2



0706B

While pressing the end backtack key (1), press the power switch (2) to turn on the power.

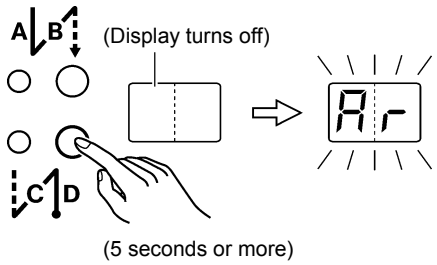
3



0707B

1. Press the start backtack key (3) so that “r” is displayed in the top row of the stitch number display.
2. Press the end backtack key (1) to set the value in the bottom row of the stitch number display to “1”.

4



3150M

1. Then, press and hold the end backtack key (1) for 5 seconds or more. (The display will turn off.)
2. After this, “Ar” will flash and the initialization will be complete.

5

Set DIP switch -3 to ON.

(The settings will be locked.)

5. ADJUSTING THE ROTARY HOOK LUBRICATION AMOUNT (-[]0[], []3[] specifications)

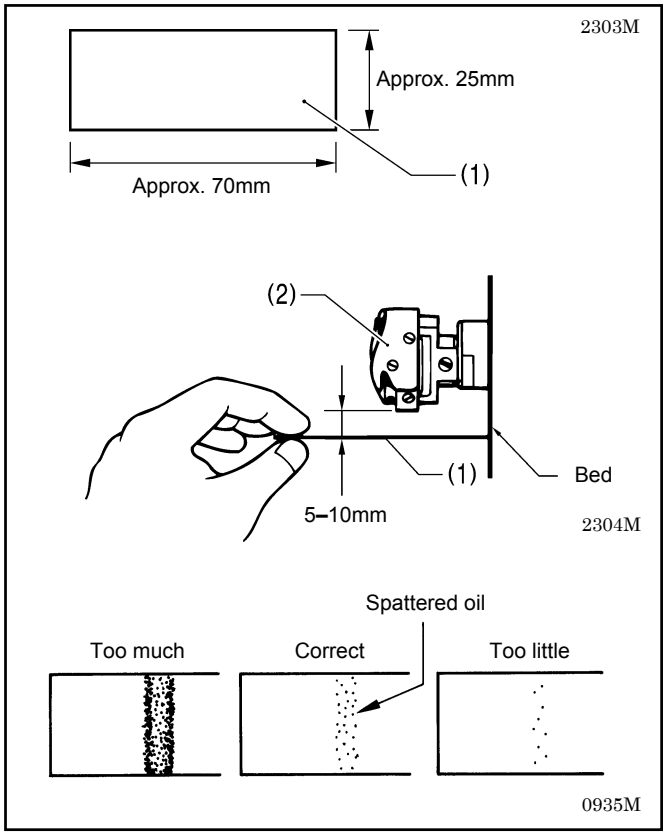
⚠ CAUTION

Be careful not to touch your fingers or the lubrication amount check sheet against moving parts such as the rotary hook or the feed mechanism when checking the amount of oil supplied to the rotary hook, otherwise injury may result.

Use the following procedure to check the amount of oil being supplied to the rotary hook when replacing the rotary hook or when changing the sewing speed.

NOTE:

If the sewing machine is sub-class -[]5[], it is a fully dry-type machine and so adjustment of the rotary hook lubrication amount is not necessary.



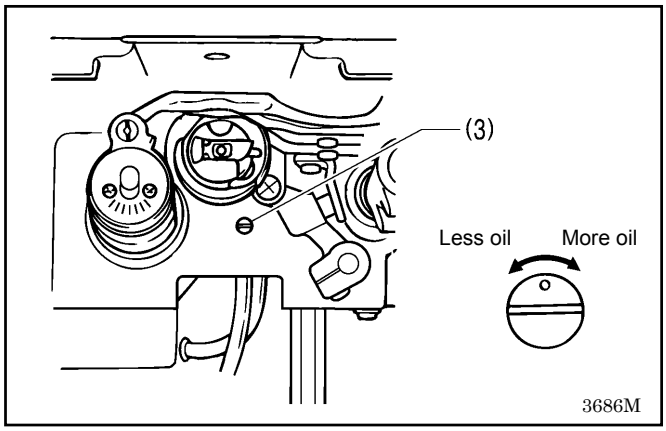
<Checking the lubrication amount>

1. Remove the thread from all points from the thread take-up to the needle.
2. Use the lifting lever to lift the presser foot.
3. Run the machine at the normal sewing speed for approximately 1 minute without sewing any material (following the same start/stop pattern as when actually sewing).
4. Place the lubrication amount check sheet (1) underneath the rotary hook (2) and hold it there. Then run the sewing machine at the normal sewing speed for 8 seconds. (Any type of paper can be used as the lubrication amount check sheet (1).)
5. Check the amount of oil which has spattered onto the sheet.

If adjustment is necessary, carry out the following operations in “Adjusting the lubrication amount”.

NOTE:

If the lubrication amount does not match the correct amount shown in the illustration at left (if the amount of spattered oil is too much or none at all), turn the adjusting screw (3) clockwise to fully tighten it, turn it back counterclockwise by 2 1/2 turns, and then carry out the following adjustment.



<Adjusting the lubrication amount>

1. Tilt back the machine head.
2. Turn the adjusting screw (3) to adjust the lubrication amount.
   - If the rotary hook adjusting screw (3) is turned clockwise, the lubrication amount becomes greater.
   - If the rotary hook adjusting screw (3) is turned counterclockwise, the lubrication amount becomes smaller.
3. Check the lubrication amount again according to the procedure given in “Checking the lubrication amount” above.
   * Turn the adjusting screw (3) and check the lubrication amount repeatedly until the lubrication amount is correct.
4. Check the lubrication amount again after the sewing machine has been used for approximately two hours.

6. ADJUSTMENTS

⚠ CAUTION

Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.

Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.

If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.

Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.

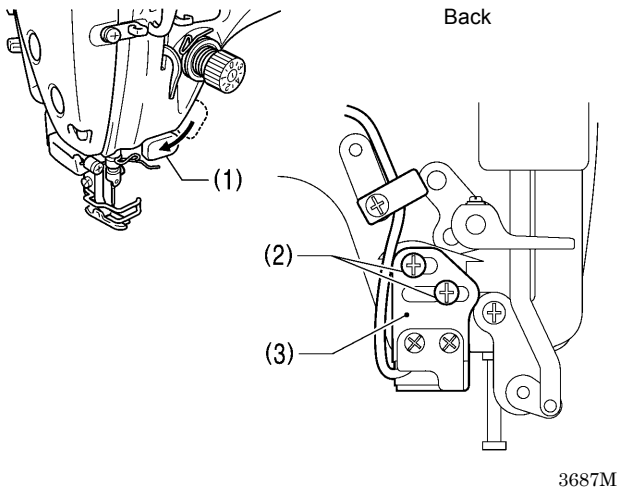
Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.

- When carrying out inspection, adjustment and maintenance
- When replacing consumable parts such as the rotary hook and knife

If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

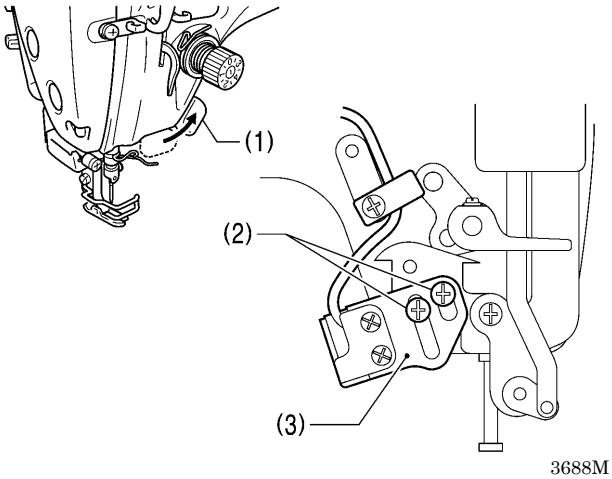
6-1. Adjusting the actuator position

<A>



3687M

<B>



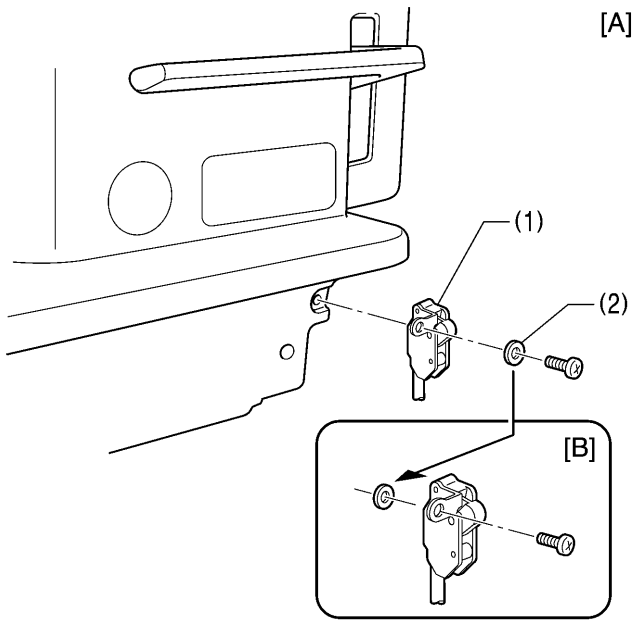
3688M

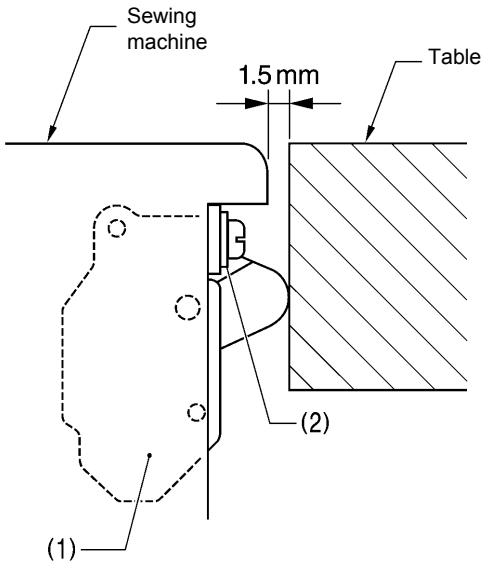
The installation position for the actuator (1) can be adjusted to <A> or <B>.
Adjust so that it is in a position where it is easy to operate.

1. Remove the two screws (2).
2. Move the switch setting base (3) to move the actuator (1) to the preferred position <A> or <B>.
3. Tighten the two screws (2).

6-2. Adjusting the safety switch position

3689M





3690M

The safety switch (1) is normally installed as shown in figure [A].
However, if the processing method used for the table leaves too much space between the machine head and the table hole, it may adversely affect the operation of the safety switch (1).

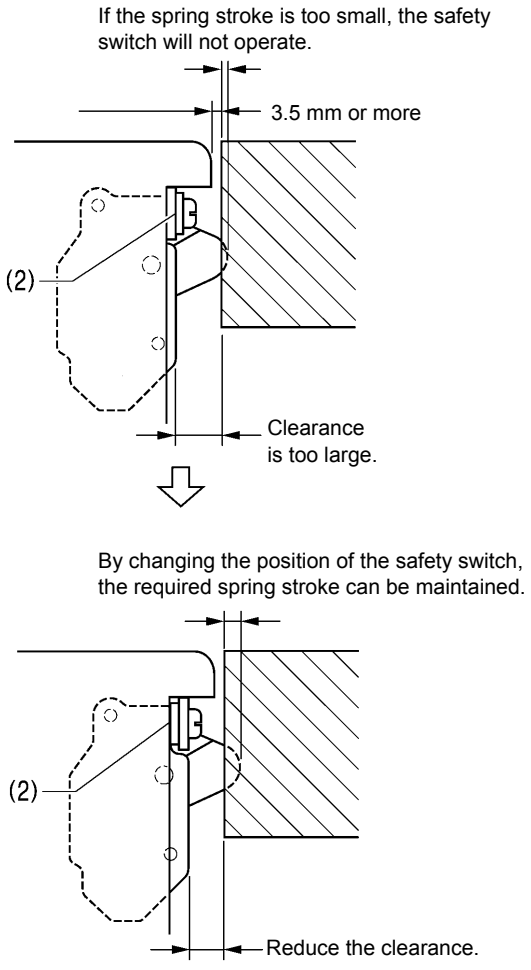
<Adjustment method>

The standard amount of clearance between the machine head and the table hole is 1.5 mm.
If the clearance is 3.5 mm or more, install the safety switch (1) so that the washer (2) is on the machine head side as shown in Figure [B].

* If the position cannot be satisfactorily adjusted in this way, add more washers of the same thickness.

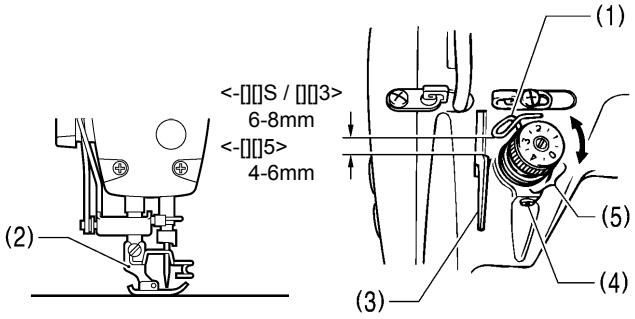
<Safety switch operation>

3691M


If the spring stroke is too small, the safety switch will not operate.
3.5 mm or more
(2)
Clearance is too large.
By changing the position of the safety switch, the required spring stroke can be maintained.
(2)
Reduce the clearance.

3692M

6-3. Adjusting the thread take-up spring

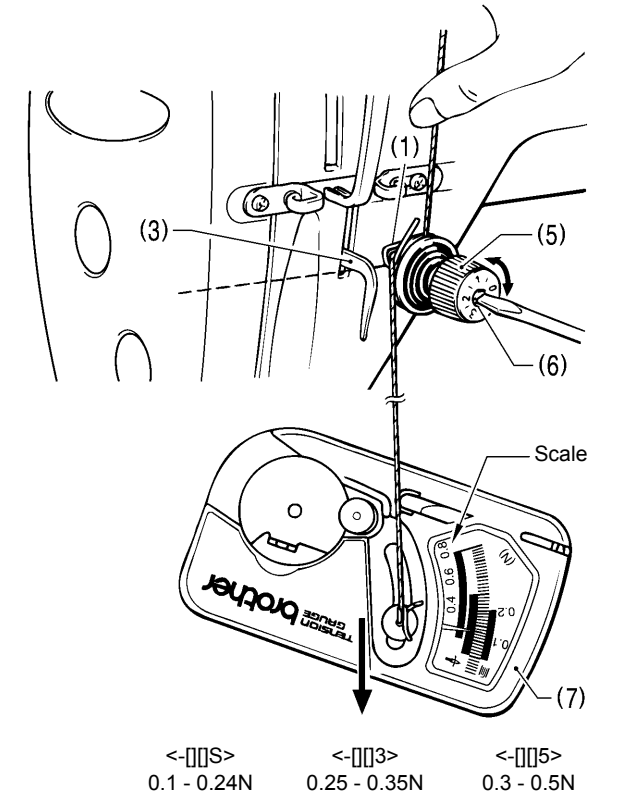


2274M 3693M

<Thread take-up spring position>

The standard position of the thread take-up spring (1) is 6-8 mm [4-6 mm for -□□5 specifications] above the surface of the thread guide (3) when the presser foot (2) is lowered.

1. Lower the presser foot (2).
2. Loosen the set screw (4).
3. Turn the thread tension bracket (5) to adjust the spring position.
4. Securely tighten the set screw (4).



3694M

<Thread take-up spring tension>

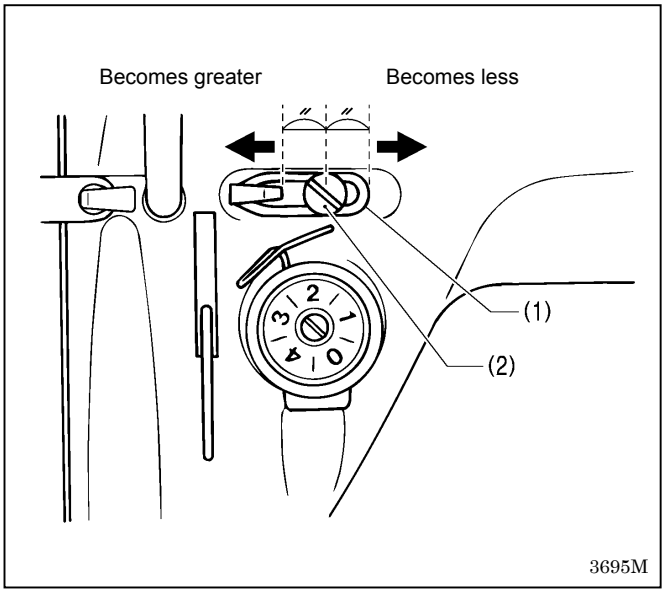
The standard tension of the thread take-up spring (1) varies in accordance with the machine specifications as shown in the table.

-□□S specifications	0.1 - 0.24N
-□□3 specifications	0.25 - 0.35N
-□□5 specifications	0.30 - 0.5N

1. Push the needle thread with your finger until it is slightly higher than the thread tension bracket (5) and so that the upper thread is not pulled out.
2. Pull the upper thread down until the thread take-up spring (1) is at the same height as the base of the thread guide (3), and then measure the tension of the thread take-up spring (1).
3. Insert a screwdriver into the slot of the tension stud (6), and turn the screwdriver to adjust the tension of the thread take-up spring (1).

NOTE: If using the tension gauge (7) (sold separately) to measure the tension, take the reading from the scale on the side of the red line.

6-4. Adjusting arm thread guide R

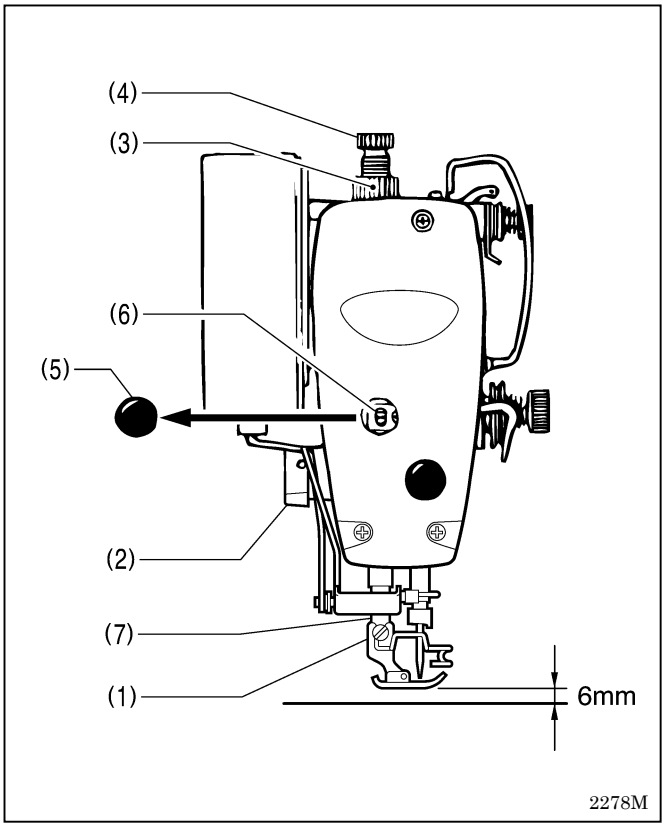


The standard position of arm thread guide R (1) is the position where the screw (2) is in the center of the adjustable range for arm thread guide R (1).

* To adjust the position, loosen the screw (2) and then move arm thread guide R (1).

- When sewing thick material, move arm thread guide R (1) to the left. (The thread take-up amount will become greater.)
- When sewing thin material, move arm thread guide R (1) to the right. (The thread take-up amount will become less.)

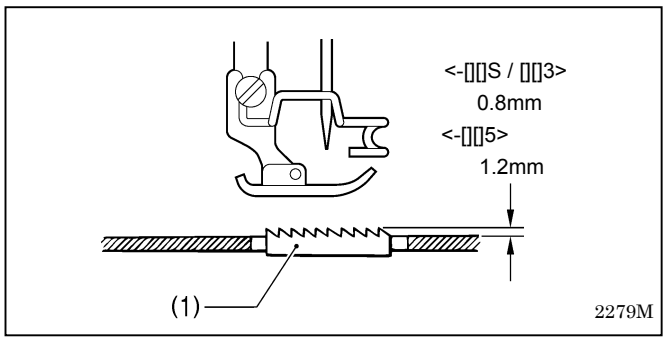
6-5. Adjusting the presser foot height



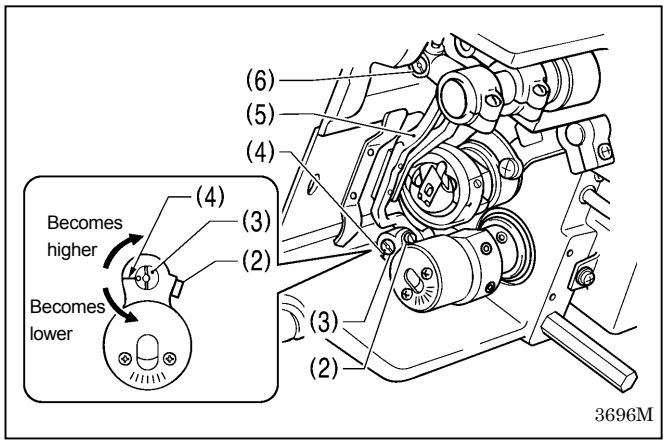
The standard height of the presser foot (1) is 6 mm when the presser foot (1) is raised by means of the lifting lever (2).

1. Loosen the nut (3) of the adjustment screw (4), and then turn the adjustment screw (4) so that there is no pressure applied to the presser foot.
2. Raise the lifting lever (2). The presser foot (1) will also rise.
3. Remove the oil cap (5).
4. Loosen the bolt (6) and then move the presser bar (7) up or down until the presser foot (1) is at the standard height of 6 mm.
5. Tighten the bolt (6).
6. Replace the oil cap (5).
7. Adjust the presser foot pressure using the adjustment screw (4), and then tighten the nut (3).

6-6. Adjusting of the feed dog height

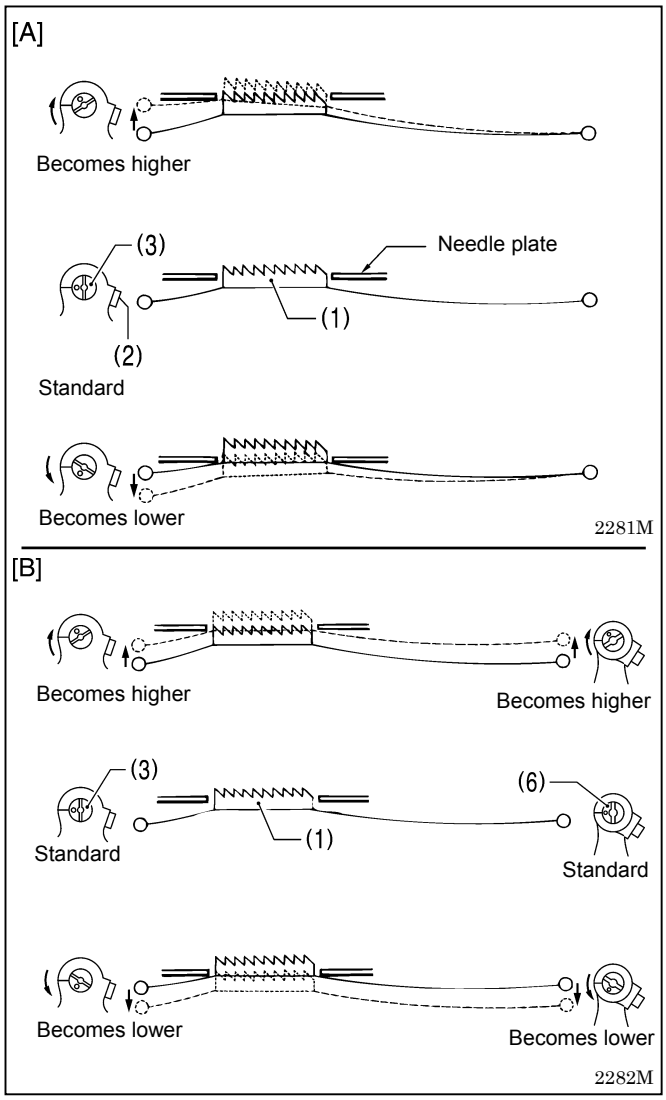


The standard height of the feed dog (1) when it is at its maximum height above the top of the needle plate is 0.8 mm for -[][]S / [][]3 specifications, and 1.2 mm for -[][]5 specifications.

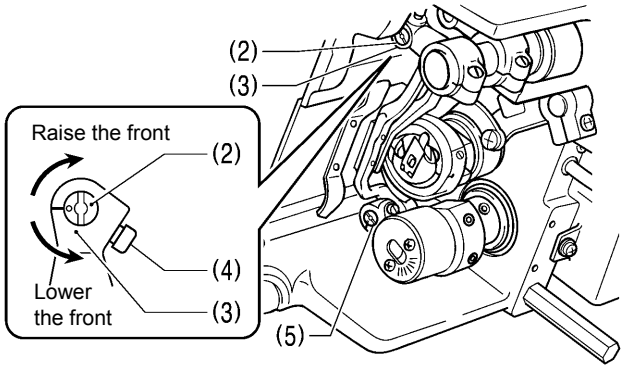


1. Turn the pulley until the feed dog (1) rises to the highest position.
2. Tilt back the machine head.
3. Loosen the screw (2).
4. Turn the feed lifting rock bracket stud (3) within a range of 90° from the reference line (4) to adjust the vertical height of the feed bar (5). (Fig. [A])
5. Tighten the screw (2).

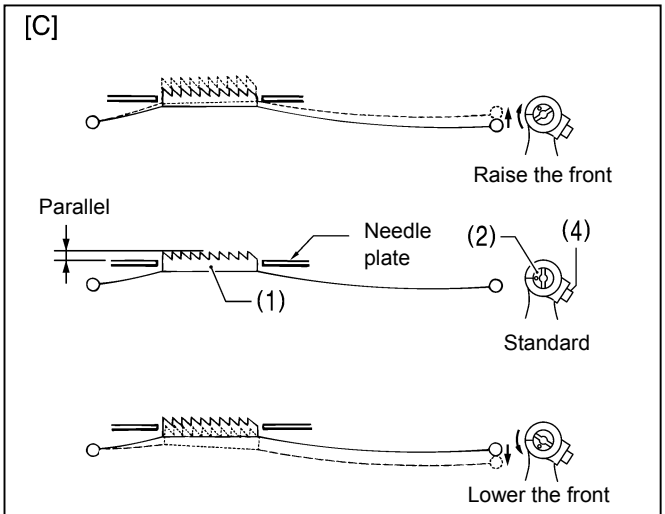
* If you are worried about the angle of the feed dog (1), turn the shaft (6) while carrying out the above adjustment. (Fig. [B])
(Refer to “6-7. Adjusting the feed dog angle” on the next page for details of this operation.)



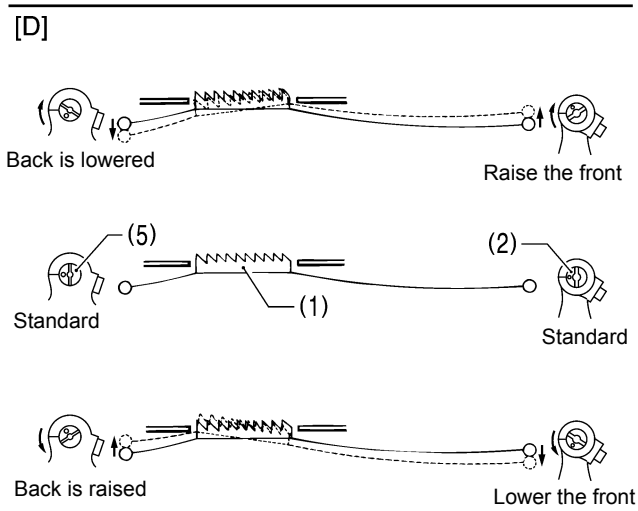
6-7. Adjusting the feed dog angle



3697M



2284M



2285M

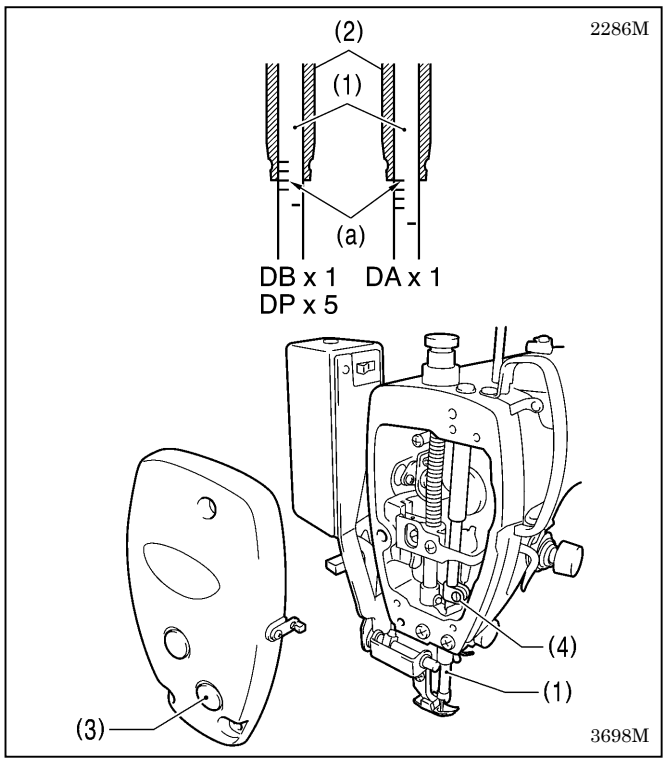
The standard angle for the feed dog (1) when it is at its highest position above the needle plate is when the "○" mark (or V groove) on the shaft (2) is aligned with the feed rocker bracket arm (3) and the feed dog (1) is parallel to the needle plate.

1. Turn the machine pulley to move the feed dog (1) to its highest position above the needle plate.
2. Tilt back the machine head.
3. Loosen the two set screws (4).
4. Turn the shaft (2) in the direction of the arrow within a range of 90° with respect to the standard position. (Fig. [C])
   - In order to prevent puckering, lower the front of the feed dog (1).
   - In order to prevent the material from slipping, raise the front of the feed dog (1).
5. Securely tighten the two set screws (4).

* If you would like to tilt the feed dog (1) further, turn the feed lifting rock bracket stud (5) while carrying out the above adjustment. (Fig. [D])
(Refer to "6-6. Adjusting the feed dog height" on the previous page for details of this operation.)

* The height of the feed dog (1) will change after the angle has been adjusted, so it will be necessary to re-adjust the height of the feed dog (1).

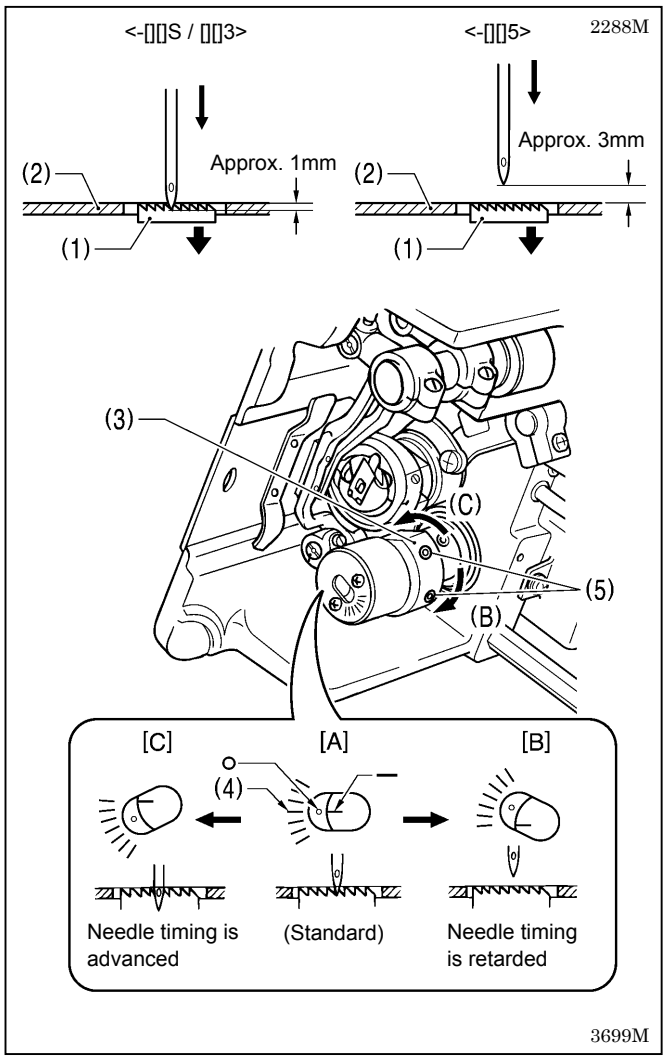
6-8. Adjusting the needle bar height



Reference line (a), which is the second line from the bottom of the needle bar (1)(fourth line from the bottom when using a DA x 1 needle) should be aligned with the lower edge of the needle bar bush D (2) as shown in the illustration when the needle bar (1) is at its lowest position.

1. Turn the machine pulley to set the needle bar (1) to its lowest position.
2. Remove the oil cap (3).
3. Loosen the screw (4) and then move the needle bar (1) up or down to adjust its position.
4. Securely tighten the screw (4).
5. Replace the oil cap (3).

6-9. Adjusting the needle and feed mechanism timing



The standard position for point of the needle is as described below when the feed dog (1) is lowered from its highest position until it is aligned with the top of the needle plate (2). (At this time, the "-" mark on the lower shaft will be aligned with the center of the scale (4) ("O" mark) on the vertical cam (3).)

<-[][]S / [][]3>

The top of the feed dog (1) and the top of the needle plate (2) should be aligned, and the point of the needle should be approximately 1 mm below the needle plate (2).

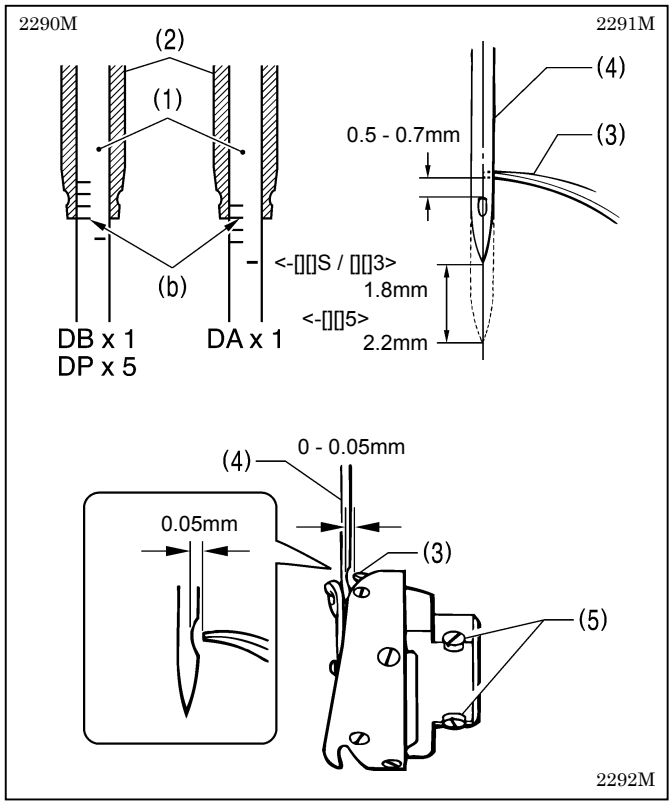
<-[][]5>

The top of the feed dog (1) and the top of the needle plate (2) should be aligned, and there should be a clearance of approximately 3 mm between the point of the needle and the needle plate (2).

1. Tilt back the machine head.
2. Loosen the two set screws (5), and then turn the vertical cam (3) sligtly to adjust the timing. (Use the "-" mark on the lower shaft and the alignment position on the scale (4) of the vertical cam (3) as a guide.)
   - To set to the standard position, align the "-" mark on the lower shaft with the center of the scale (4) ("O" mark) on the vertical cam (3). ([A] in the illustration)
   - To prevent material slippage from occurring, retard the needle timing. (Turn the vertical cam (3) in the direction of (B). Refer to [B] in the illustration.)
   - To improve thread tightening, advance the needle timing. (Turn the vertical cam (3) in the direction of (C). Refer to [C] in the illustration.)

   NOTE: Do not turn the vertical cam (3) too far in the direction of (C), otherwise it could cause the needle to break.
3. After adjustment is completed, securely tighten the two screws (5).

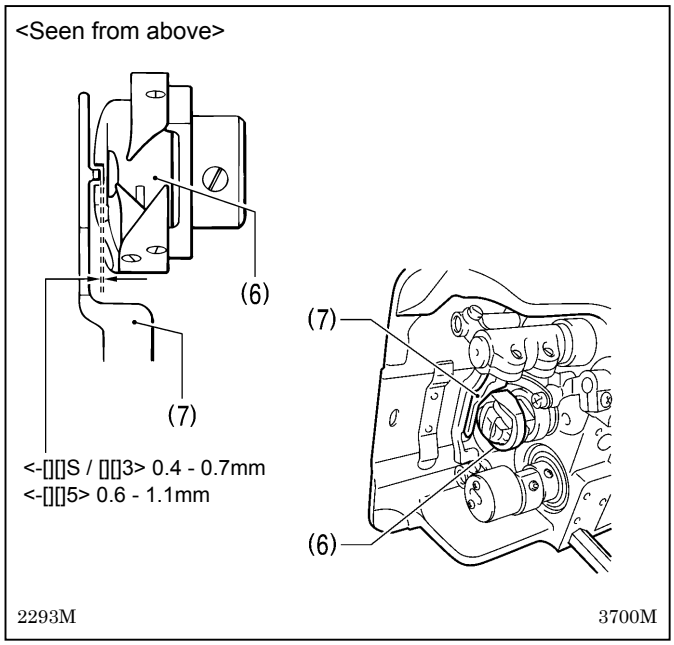
6-10. Adjusting the needle and rotary hook timing



The tip of the rotary hook (3) should be aligned with the center of the needle (4) when the needle bar (1) moves up from its lowest position to the position where reference line (b), which is the line at the bottom of the needle bar (1)(third line from the bottom when using a DA x 1 needle), is aligned with the lower edge of the needle bar bush D (2) as shown in the illustration.

(At this time, the gap between the upper edge of the needle hole and the rotary hook tip (3) will be 0.5 - 0.7 mm.)

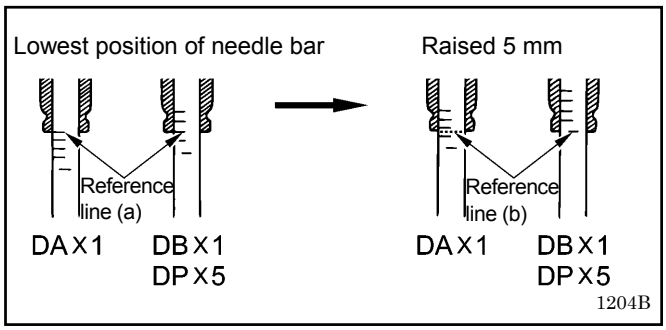
1. Turn the machine pulley to raise the needle bar (1) from its lowest position until reference line (b) is aligned with the lower edge of the needle bar bush D (2) as shown in the illustration.
   (The needle should rise by 1.8 mm [2.2 mm for -[][]5 specifications] and the distance from the needle hole to the tip of the rotary hook should be 0.5 - 0.7 mm.)
2. Loosen the three set screws (5), and then align the tip of the rotary hook (3) with the center of the needle (4).
   The distance between the tip of the rotary hook (3) and the needle (4) should be approximately 0 - 0.05 mm.
3. Securely tighten the three set screws (5).



<Checking the clearance between the rotary hook and bobbin case holder position bracket>

Check that the clearance between the rotary hook (6) and the bobbin case holder position bracket (7) is enough to allow the thread being used to pass through smoothly.
The clearance should be 0.4 - 0.7 mm for -[][]S / [][]3 models, and 0.6 - 1.1 mm for -[][]5 models.

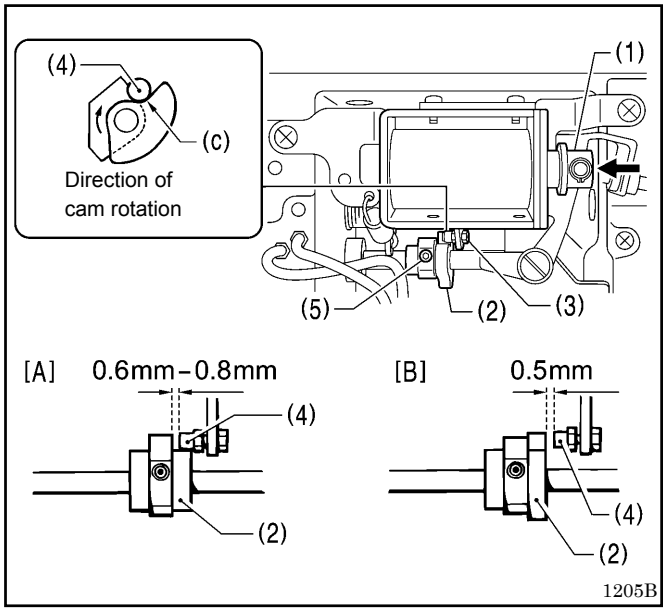
6-11. Adjusting the thread trimming timing



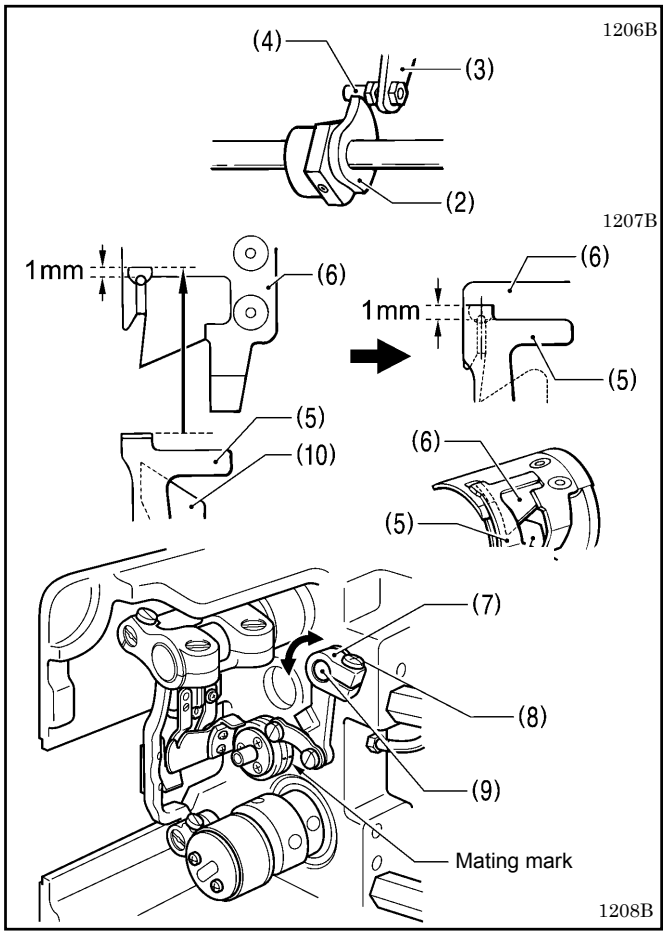
Remove the presser foot, needle plate and feed dog.

< Thread trimming cam position adjustment >

1. Turn the machine pulley to raise the needle bar 5 mm from its lowest position (reference line (a) position) so that reference line (b) is aligned with the bottom edge of the needle bar bush.



2. At the above position, push the plunger (1) of the thread trimming solenoid with your finger in the direction of the arrow.
   Adjust the position of the thread trimmer cam (2) at this time so that the roller shaft (4) of the thread trimmer cam lever assembly (3) touches the hollow (c) of the thread trimmer cam (2) and so that the clearance between the edge of the thread trimmer cam (2) and the roller shaft (4) is 0.6 to 0.8 mm, and then tighten the set screws (5). (Fig. [A])
3. Check that the clearance between the edge of the thread trimmer cam (2) and the roller shaft (4) is 0.5 mm when the roller shaft (4) returns to the right. (Fig. [B])
   * Tighten the two set screws (5) to approximately 4 N.m.



<Movable knife and fixed knife position adjustment >

1. Turn the machine pulley, and then push the plunger (1) of the thread trimming solenoid with your finger.
2. In this condition, turn the machine pulley until the roller shaft (4) of the thread trimmer cam lever assembly (3) is sitting on top of the thread trimmer cam (2), then move the thread trimmer lever (7) to adjust its position so that the tip of the fixed knife (5) and the blade of the movable knife (6) are meshed by 1 mm, and then tighten the screw (8).
   * Adjust so that the meshing amount is 1 mm at this time, by using the position where the mating marks on the thread trimmer holder and the bushing are aligned as a guide.
   * Tighten the screw (8) so that there is no play in the forked shaft (9).
   * The lower thread finger (10) must be underneath the movable knife (6).
3. Install the feed dog, needle plate and presser foot.

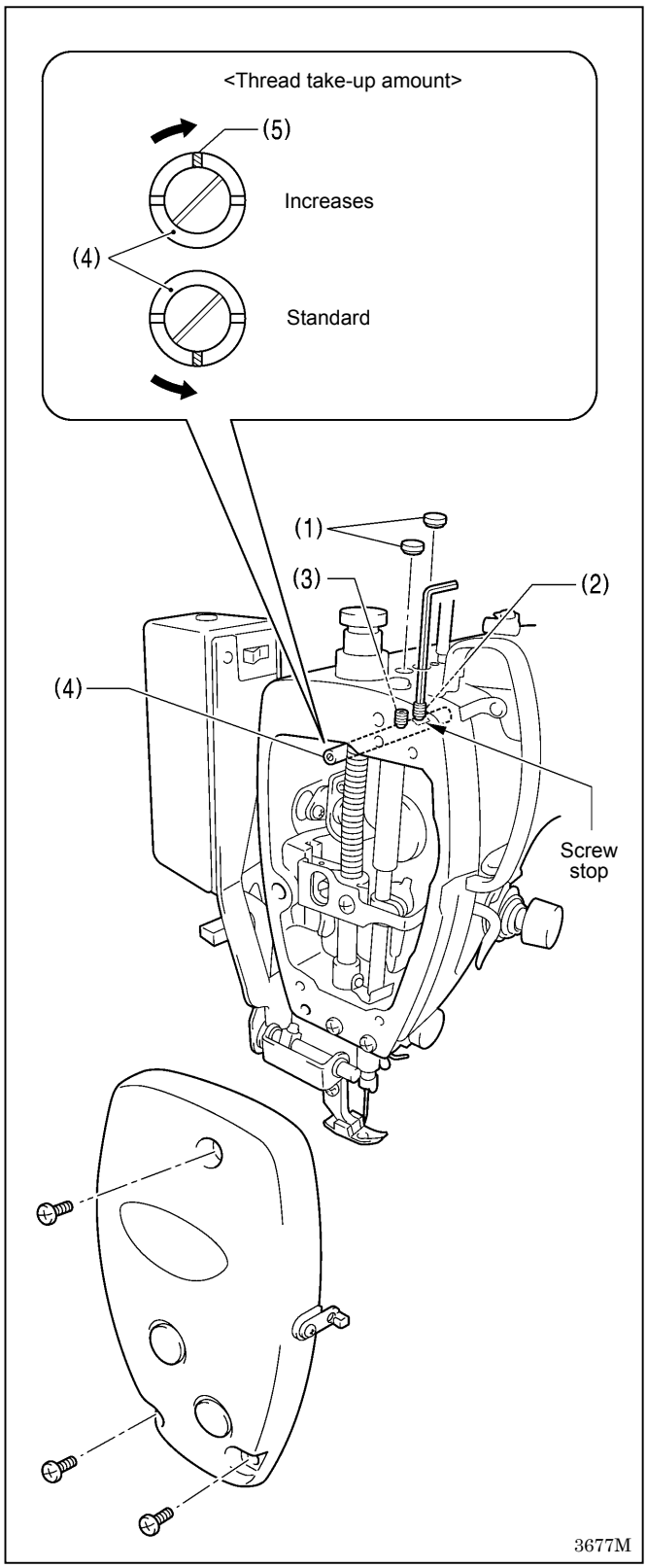
6-12. Adjusting the thread take-up amount (-[][]3 specifications)

CAUTION

Turn off the power switch before carrying out this operation.
The machine may operate if the treadle is depressed by mistake, which could result in injury.

NOTE:

Do not use this function with models that are not -[][]3 specifications.

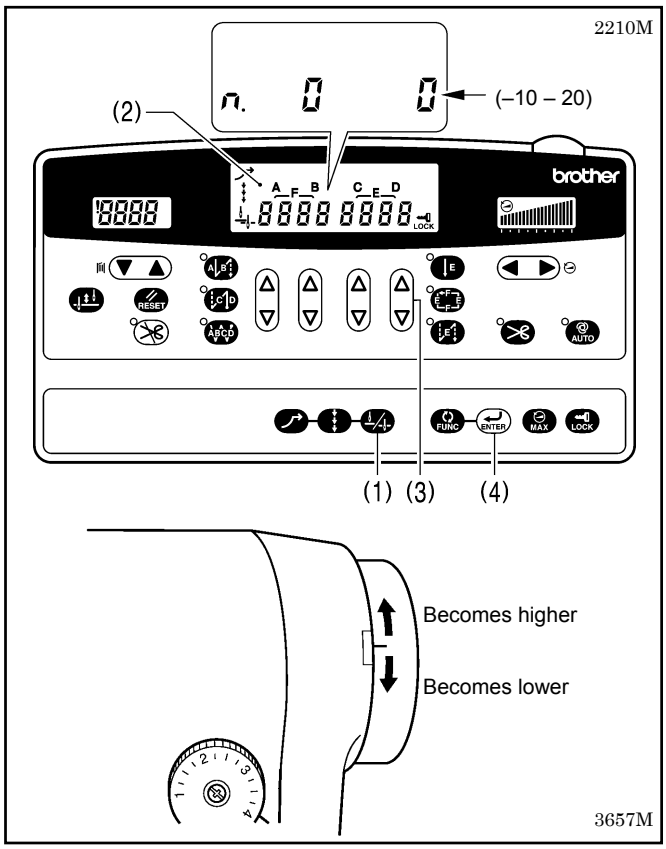


If the thread take-up amount is small and the thread breaks easily when sewing heavy materials, you can increase the thread take-up amount.

1. Remove the face plate.
2. Remove the two rubber caps (1).
3. Use a hexagonal wrench 3 to loosen the set screws (2) and (3) by approximately two turns.
4. Adjust the thread take-up amount.

   <To increase the thread take-up amount>
   Turn the thread take-up support shaft (4) clockwise so that the groove (5) is facing straight upward.
   <To return the thread take-up amount to the standard setting>
   Turn the thread take-up support shaft (4) counterclockwise so that the groove (5) is facing straight downward.
5. With the thread take-up support shaft (4) pushed in as far as it will go, first tighten the set screw (2) until it touches the screw stop on the thread take-up support shaft (4).
6. After this, tighten the set screw (3).
7. Install the two rubber caps (1).
8. Install the face plate.

6-13. Adjusting the needle up stop position (When using the operation panel)



1. While pressing the needle up/down key (1), turn on the power switch.
2. “n.0 xx” will appear in green in the main display (2).
   (“xx” is the setting value for the needle up stop position, and “0” is the default setting.)
3. Press the △ or ▽ key (3) to change the setting value for the needle up stop position.
   - If you press the △ key, the setting value will increase up to 20 and the needle up stop position will become lower.
   - If you press the ▽ key, the setting value will decrease down to -10 and the needle up stop position will become higher.
4. Press the ENTER key (4) for two seconds or more.
   A long buzzer will sound and the main display (2) will change to stitch number display mode. (This completes the needle up stop position setting.)

* A setting value of “10” corresponds to an angle of rotation of approximately 10° for the upper shaft.
* If DIP switch 3 is not set to OFF, this adjustment cannot be carried out.

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6-14. Setting the needle up stop position and needle down stop position (If using the control box panel)

Meaning of displays during setting

- The stop position is set numerically, and “A” to “F” represent the numbers “10” to “15” respectively.
- A setting value of “8” corresponds to an angle of rotation of approximately 8° for the upper shaft.

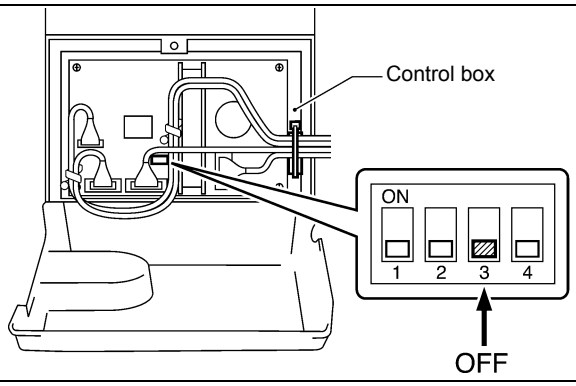
Display	A	b	c	d	E	F
Value	10	11	12	13	14	15

<Before setting>

⚠ DANGER

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

1



Set DIP switch -3 to OFF.

(This will cancel the lock so that the functions can be set.)

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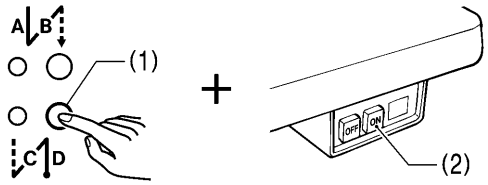
2



While pressing the end backtack key (1), press the power switch (2) to turn on the power.

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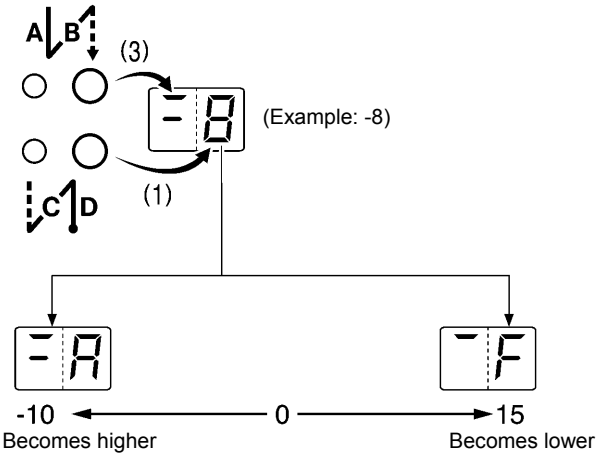
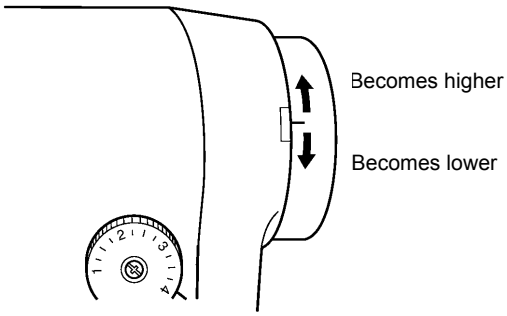
<Needle up stop position>

1



1. Press the start backtack key (3) so that "¯" is displayed in the top row of the stitch number display.
2. Press the end backtack key (1) to set the value.



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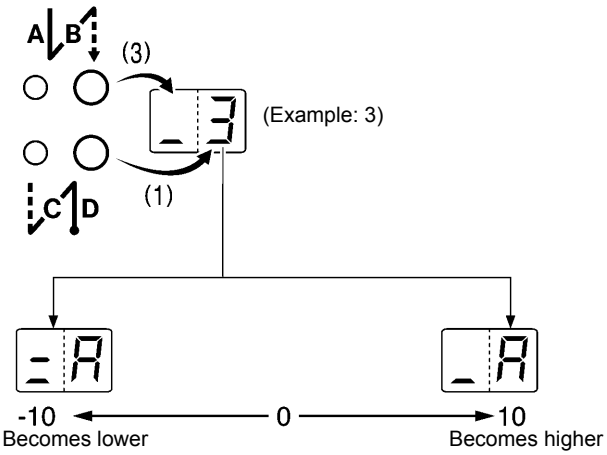
2

Set DIP switch -3 to ON.
(The settings will be locked.)

<Needle down stop position>

1



1. Press the start backtack key (3) so that "-" is displayed in the top row of the stitch number display.
2. Press the end backtack key (1) to set the value.

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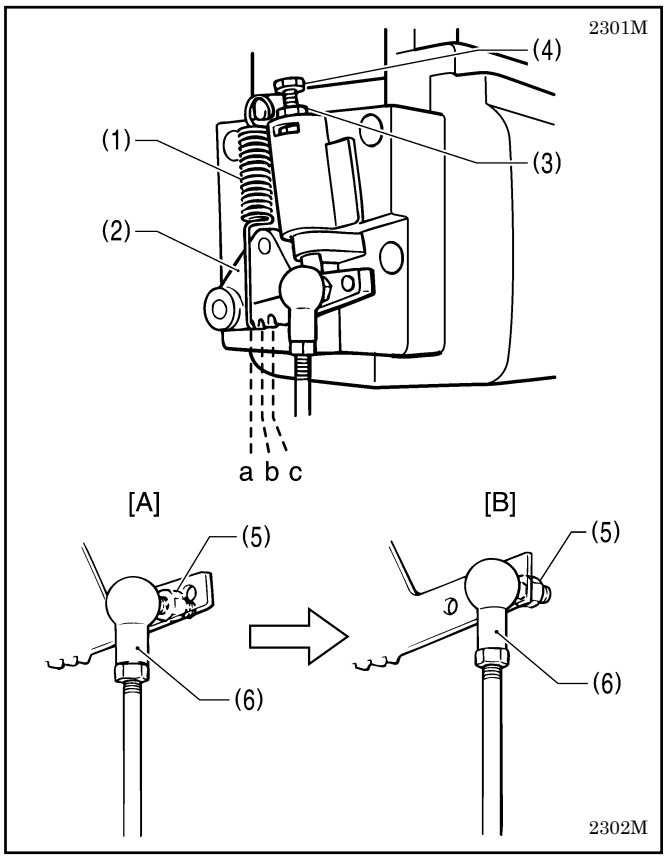
2

Set DIP switch -3 to ON.
(The settings will be locked.)

6-15. Adjusting the treadle



<Forward depression sensitivity adjustment>

If the machine starts running at low speed when your foot is simply resting on the treadle, or if the treadle pressure is felt to be too weak, adjust the position (a to c) at which the treadle spring (1) is hooked onto the treadle lever (2).

* a is the weakest position, and it becomes gradually stronger at b and c respectively.

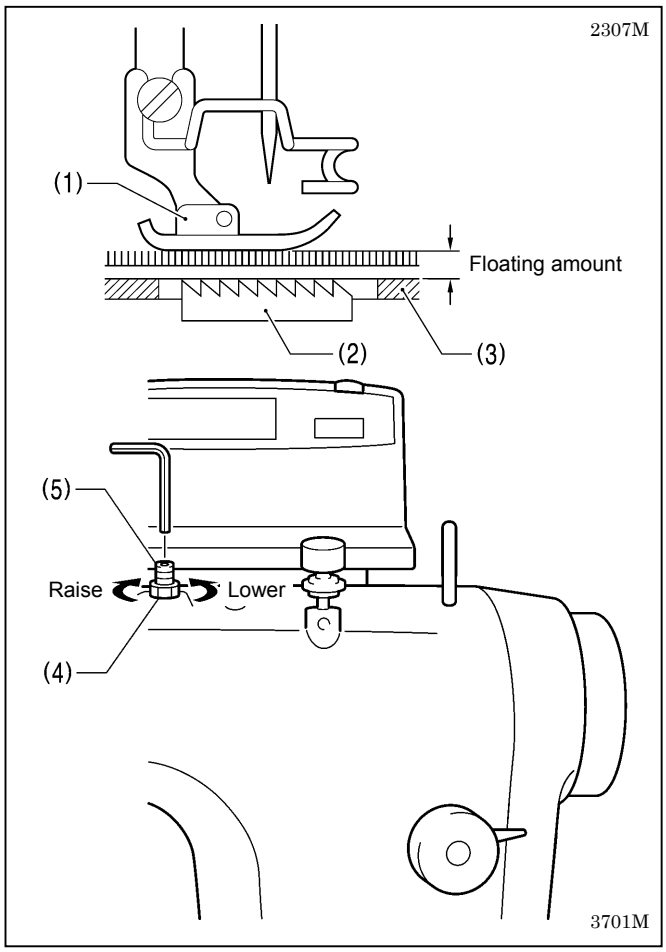
<Backward depression sensitivity adjustment>

1. Loosen the nut (3) and turn the bolt (4).
   * When the bolt (4) is tightened, the treadle operation becomes heavier, and when it is loosened, the operation becomes lighter.
2. Tighten the nut (3).

<Adjusting the treadle stroke>

Remove the nut (5), and then move the connecting rod joint (6) from the position in figure A to the position in figure B. The treadle stroke will then be increased by approximately 27 %.
At this time, the treadle forward and backward depression sensitivity will change, so readjust if necessary.

6-16. Adjusting the presser foot floating amount (minute lifting amount)



When sewing stretch materials and materials with long pile, you can make minute adjustments to the floating amount for the presser foot (1) in accordance with the material.

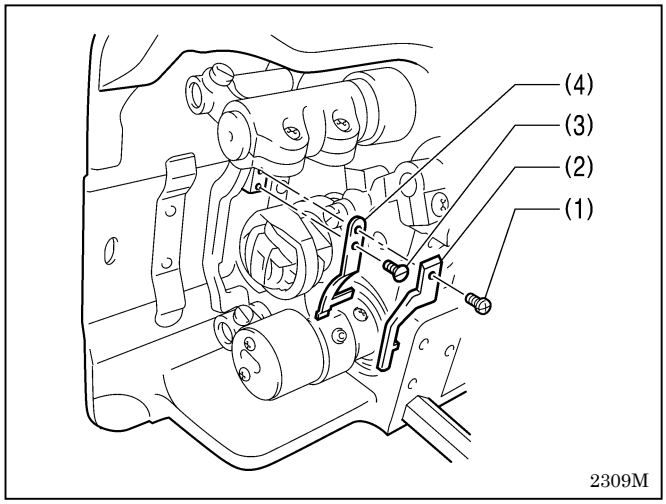
1. Turn the sewing machine pulley by hand to move the feed dog (2) below the needle plate (3).
2. Use the lifting lever to lower the presser foot (1).
3. Loosen the nut (4).
4. Use a hexagon wrench to turn the adjusting screw (5) to adjust the floating amount.
   - To raise the presser foot (1) ...
     Turn the adjusting screw (5) clockwise.
   - To lower the presser foot (1) ...
     Turn the adjusting screw (5) counterclockwise.
5. Tighten the nut (4).
   * After making the adjustment, sew a piece of material to check the floating amount.

7. REPLACING PARTS

⚠ CAUTION

- Replacement of parts should only be carried out by a qualified technician.
- Use only the proper replacement parts as specified by Brother.
- Turn off the power switch and disconnect the power cord before replacing any parts.
  The machine may operate if the treadle is depressed by mistake, which could result in injury.
- Use both hands to hold the machine head when tilting it back or returning it to its original position. If only one hand is used, the weight of the machine head may cause your hand to slip, and your hand may get caught.
- Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin, otherwise inflammation can result.
  Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhea.
  Keep the oil out of the reach of children.

7-1. Fixed knife

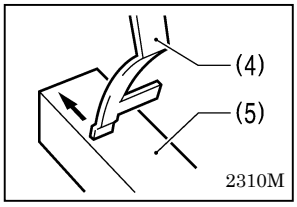


1. Tilt back the machine head.
2. Remove the screw (1), and then remove the rotary hook stopper (2).
3. Remove the screw (3), and then remove the fixed knife (4).

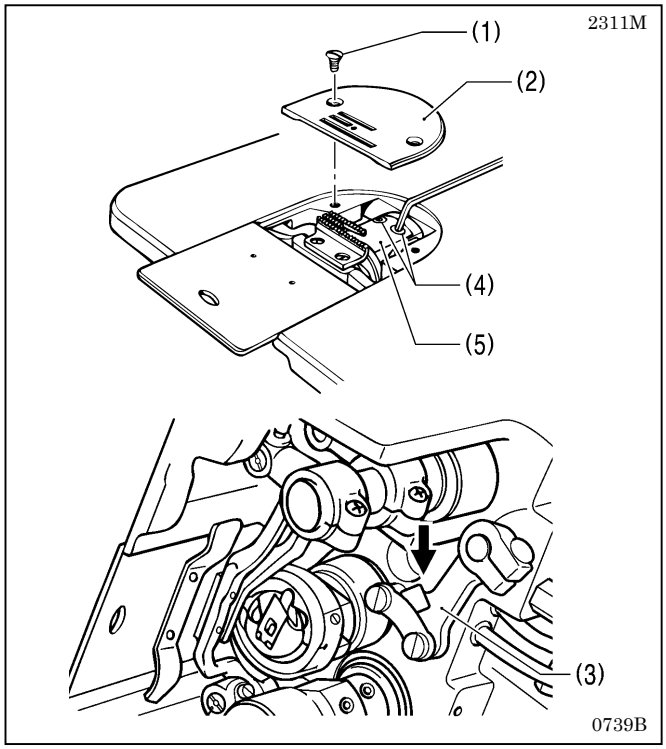
   * Carry out the above steps in reverse to install the fixed knife (4).

Sharpening the fixed knife

If the cutting performance deteriorates, sharpen the fixed knife (4) on a whetstone (5) as shown in the illustration.



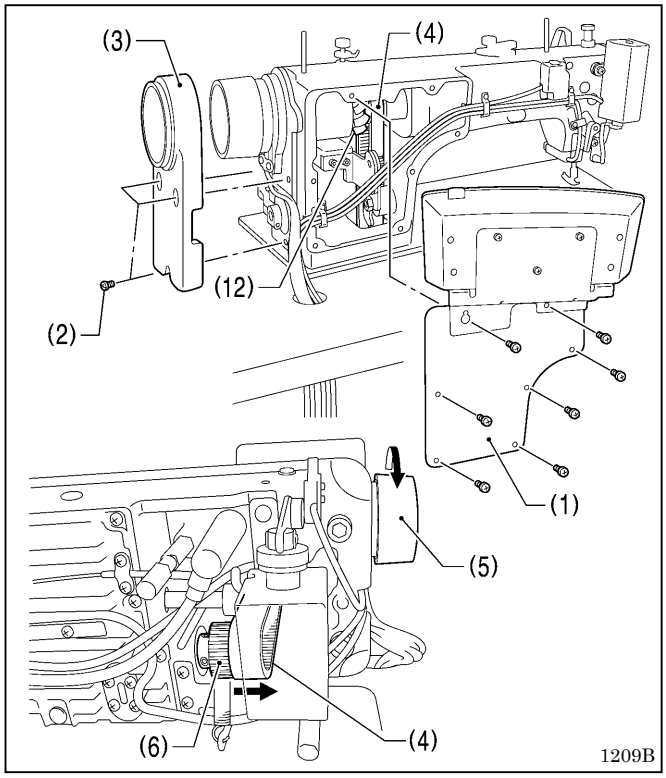
7-2. Movable knife



1. Remove the needle.
2. Lift up the presser foot using the lifting lever.
3. Remove the two screws (1), and then remove the needle plate (2).
4. Turn the machine pulley to raise the needle bar to its highest position.
5. Tilt back the machine head.
6. Push the thread trimmer connecting rod (3) in the direction of the arrow until the two screws (4) can be seen.
7. Remove the two screws (4), and then remove the movable knife (5).

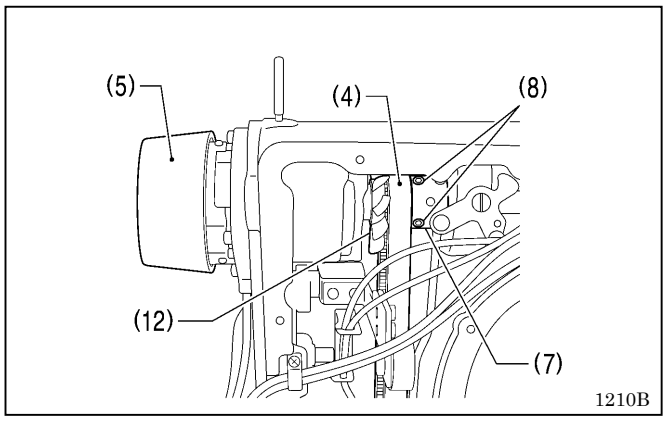
   * Carry out the above steps in reverse to install the movable knife (5).

7-3. Motor and timing belt

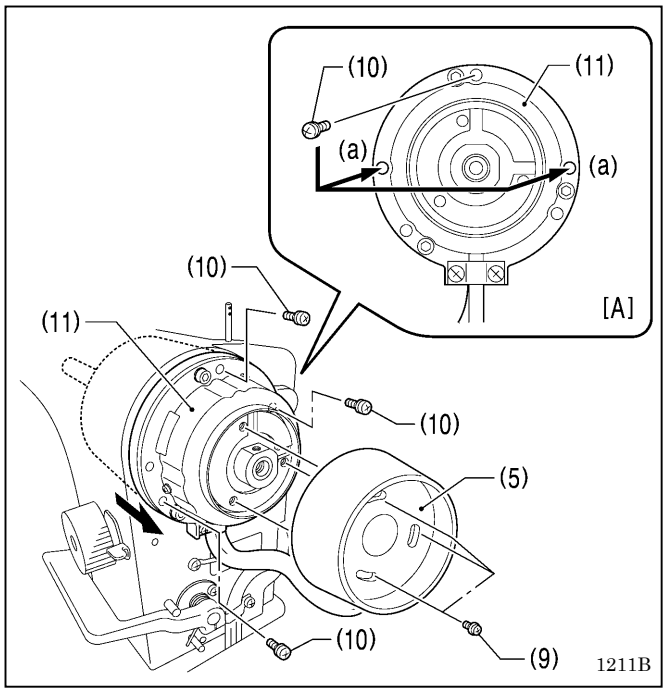


< Timing belt removal >

1. Remove the side plate (1).
2. Remove the three screws (2), and then remove the motor cover (3).
3. Tilt back the machine head.
4. While pushing the timing belt (4) in the direction of the arrow, turn the machine pulley (5) forward to remove the timing belt (4) from timing pulley D (6).
5. Return the machine head to its original position.



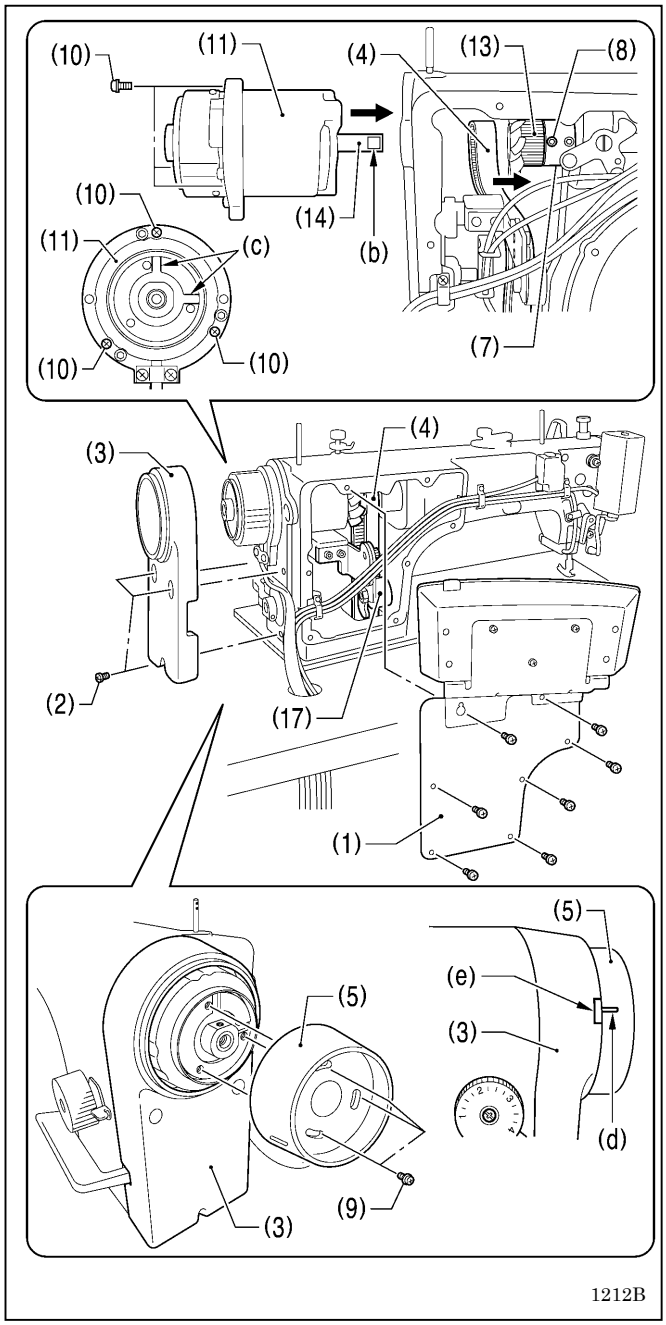
6. Turn the machine pulley (5) until the four set screws (8) on the joint (7) are facing toward the front.
   Loosen the two set screws (8) at the left by about five turns each.



7. Remove the three screws (9), and then remove the machine pulley (5).
8. Remove the three screws (10), and then remove the motor (11).
   * If it is difficult to remove the motor (11), tighten one of the removed screws (10) into the screw hole (a) at the left or right. The motor (11) can then be pulled forward and removed. (Fig. [A])
9. Pull out the timing belt (4) by hand while being careful not to get it caught on the fan (12).

< Motor removal >

Carry out steps 1 and 2 and steps 6 to 8 of <Timing belt removal>.



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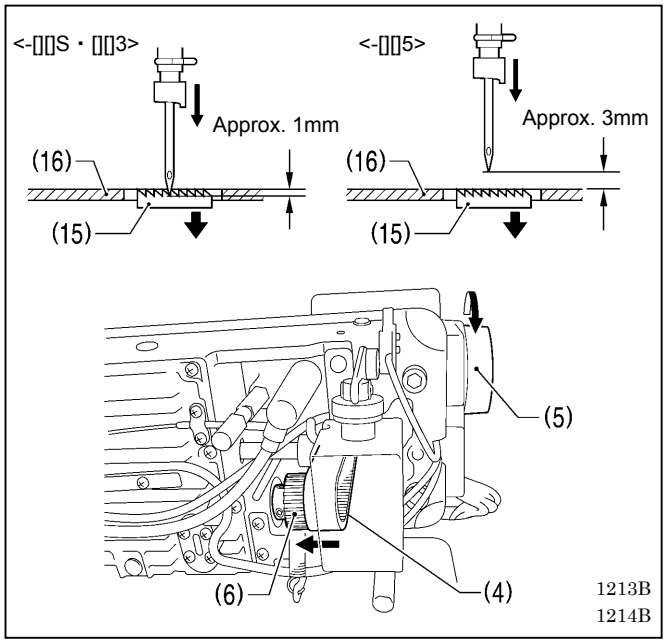

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1214B

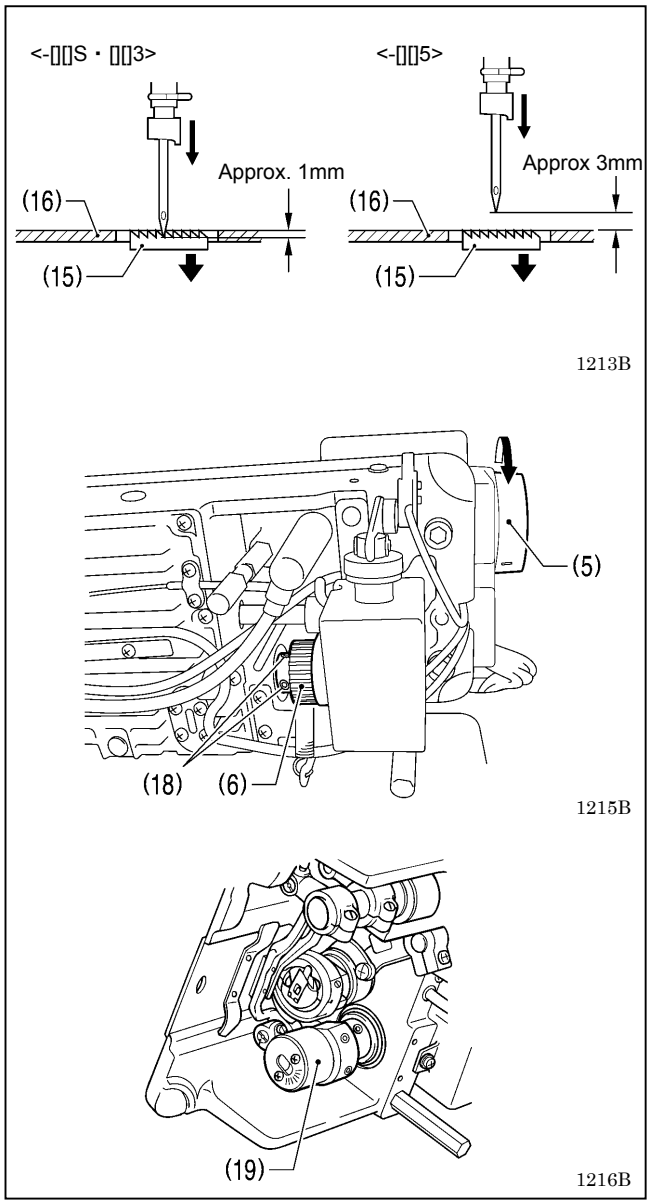
< Timing belt installation >

1. Place the timing belt (4) onto timing pulley U (13).
2. Secure the motor (11) with the three screws (10).
   * Insert the motor (11) so that the upper set screws (8) on the joint (7) are facing toward the front and also so that the notch (b) on the motor shaft (14) is facing toward the front.
3. Tighten the two set screws (8) at the left side of the joint (7) starting from the one at the top.
   * Check that the notch (c) on the motor is in the position shown in the illustration and that the upper set screws (8) on the joint (7) is facing toward the front at this time.
4. Secure the motor cover (3) with the three screws (2).
5. Raise the thread take-up to its highest position, turn the machine pulley (5) so that the reference line (d) is aligned with the mark (e) on the motor cover (3) as shown in the illustration, and then secure the machine pulley (5) by tightening the three screws (9).
   * Tighten the three screws (9) so that they are in the middle of the screw holes. (The reference line (d) and the mark (e) may move out of alignment when tightening the screws, but this is not a problem.)
6. Adjust the positions of the machine pulley (5) and timing pulley D (6) as follows.
   1) Tilt back the machine head.
   2) Turn timing pulley D (6) forward to lower the feed dog (15) until it is at the same height as the needle plate (16).
   3) Turn the machine pulley (5) forward to adjust so that the tip of the needle is at the following position.
   <-[][]S・[][]3> So that the point of the needle is approximately 1 mm below the needle plate (16)
   <-[][]5> So that there is a clearance of approximately 3 mm between the point of the needle and the top of the needle plate (16)
7. Place the timing belt (4) onto timing pulley D (6).
   * Check that the timing belt (4) is placed on the back position of the tension pulley (17).
8. Turn the machine pulley (5) forward until the timing belt (4) is set securely.
9. Return the machine head to its original position.
10. Install the side plate (1).

   * After the timing belt has been installed, be sure to then carry out the steps in <Timing belt installation check> (refer to the next page).

< Motor installation >

Carry out steps 2 to 5 and step 10 of <Timing belt installation>.



< Timing belt installation check >

1. Check that the needle and rotary hook timing is correct.
   (Refer to “6-10. Adjusting the needle and rotary hook timing”.)
   * If they are correct, continue from step 5, otherwise continue from step 2.

2. Check that the needle and feed mechanism timing is correct.
   Turn the machine pulley (5) forward to lower the feed dog (15) from its highest position until it is aligned with the top of the needle plate (16), and check that the tip of the needle is at the following position at this time.

<-[][]S・[][]3> The top of the feed dog (15) and the top of the needle plate (16) should be aligned, and the point of the needle should be approximately 1 mm below the needle plate (16).

<-[][]5> The top of the feed dog (15) and the top of the needle plate (16) should be aligned, and there should be a clearance of approximately 3 mm between the point of the needle and the needle plate (16).

   * If it is not in the correct position, carry out the following steps.
   1) Tilt back the machine head, and then loosen the two set screws (18).
   2) Turn timing pulley D (6) forward to lower the feed dog (15) until it is at the same height as the needle plate (16).
   3) While holding the vertical cam (19) with one hand so that it will not move, turn the machine pulley (5) forward to lower the needle to the correct position.
   4) Tighten the two set screws (18).

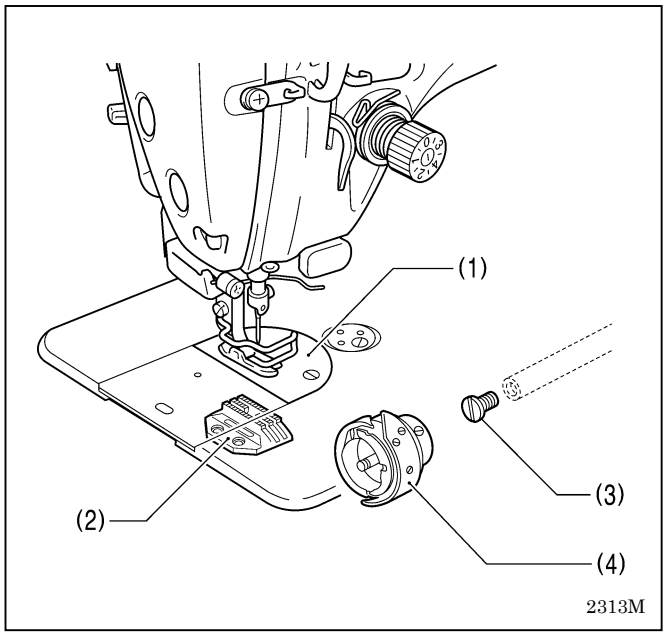
3. Adjust the needle and rotary hook timing so that it is correct.
   (Refer to “6-10. Adjusting the needle and rotary hook timing”.)
4. Check that the thread trimming timing is correct. If it is not correct, adjust it by following the adjustment procedure.
   (Refer to “6-11. Adjusting the thread trimming timing”.)
5. Set the sewing machine to needle up stopping, and then operate the sewing machine and let it stop. Check that the reference line (d) on the machine pulley (5) is within the range of the mark (e) on the motor cover (3) at this time.

7-4. Rotary hook RP

If replacing the standard rotary hook with a rotary hook RP (lubrication-free rotary hook) on sub-class -40[] or -43[] machines, use the following parts.

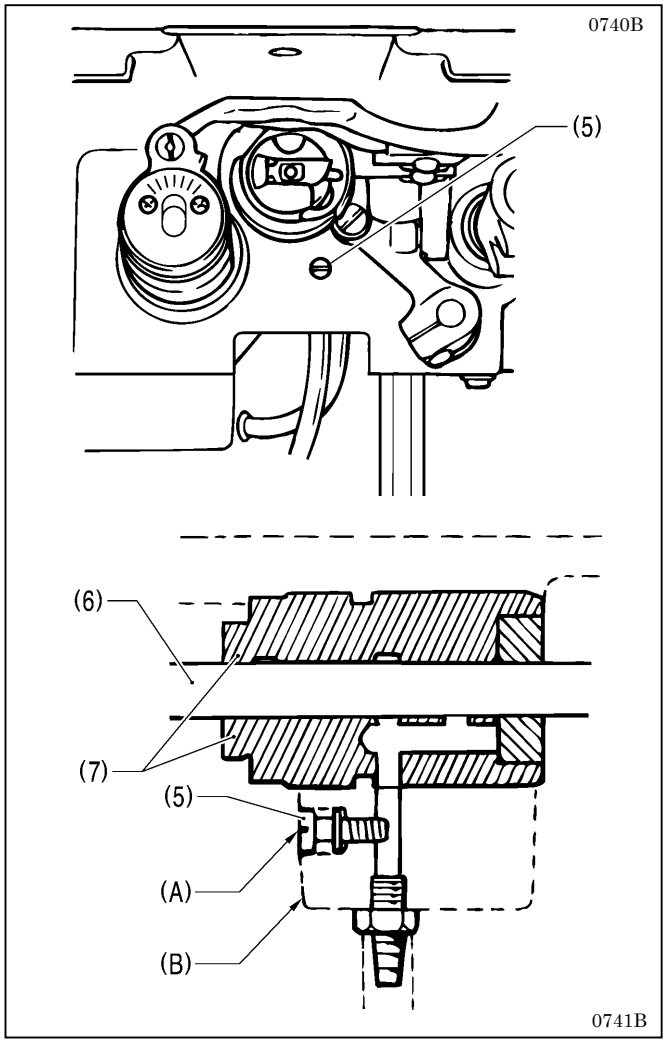
S52936-001 (ROTARY HOOK, W/BOX)
S35786-001 (SCREW, CAP)

NOTE: When using the rotary hook RP (lubrication-free rotary hook), set the sewing speed to 4,000 rpm or less.



<Replacing>

1. Remove the needle and the presser foot.
2. Remove the needle plate (1) and the feed dog (2).
3. Remove the rotary hook.
4. Replace the screw (3).
   Tighten the screw (3) securely.
5. Install the rotary hook RP(4) and the needle.
   After installing the rotary hook RP, adjust the needle and rotary hook timing. (Refer to page 31.)
6. Install the feed dog (2).
7. Install the needle plate (1).
   Adjust the installation position of the feed dog (2) so that it is in the middle of the needle plate (1) groove.
8. Install the presser foot.



<Adjusting the adjusting screw>

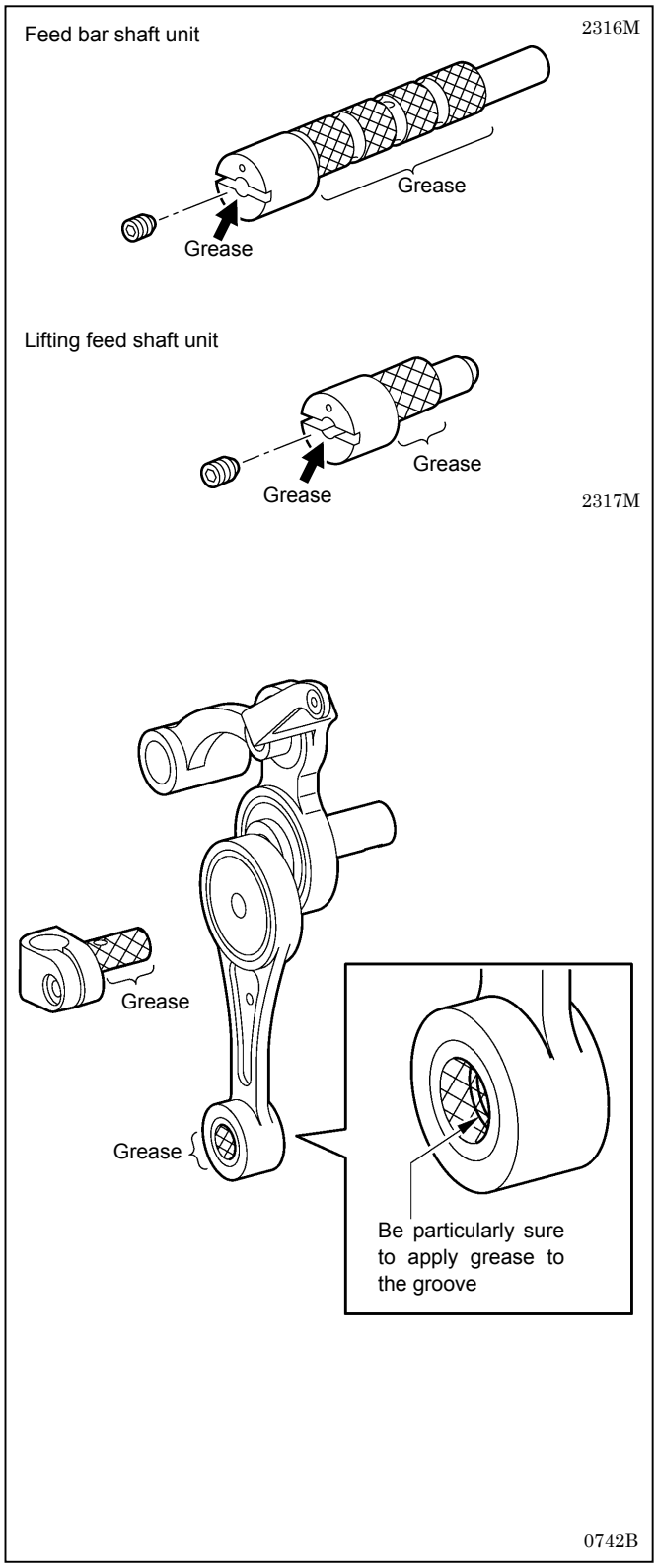
Tighten the adjusting screw (5) as far as it will go, and then turn it back the other way about three full turns.
(At this time, the head (A) of the adjusting screw (5) should be almost flush with the edge (B) of the bed.)

NOTE: If the sewing machine is used while the adjusting screw (5) is in the fully-tightened position, it will cause oil to leak out through the gap between the rotary hook shaft (6)and the bracket (7).

7-5. Feed bar shaft, Lifting feed shaft

When changing over these parts, apply grease as described below and then install the parts to the sewing machine.

* Use Brother-specified grease (SA7300-001).



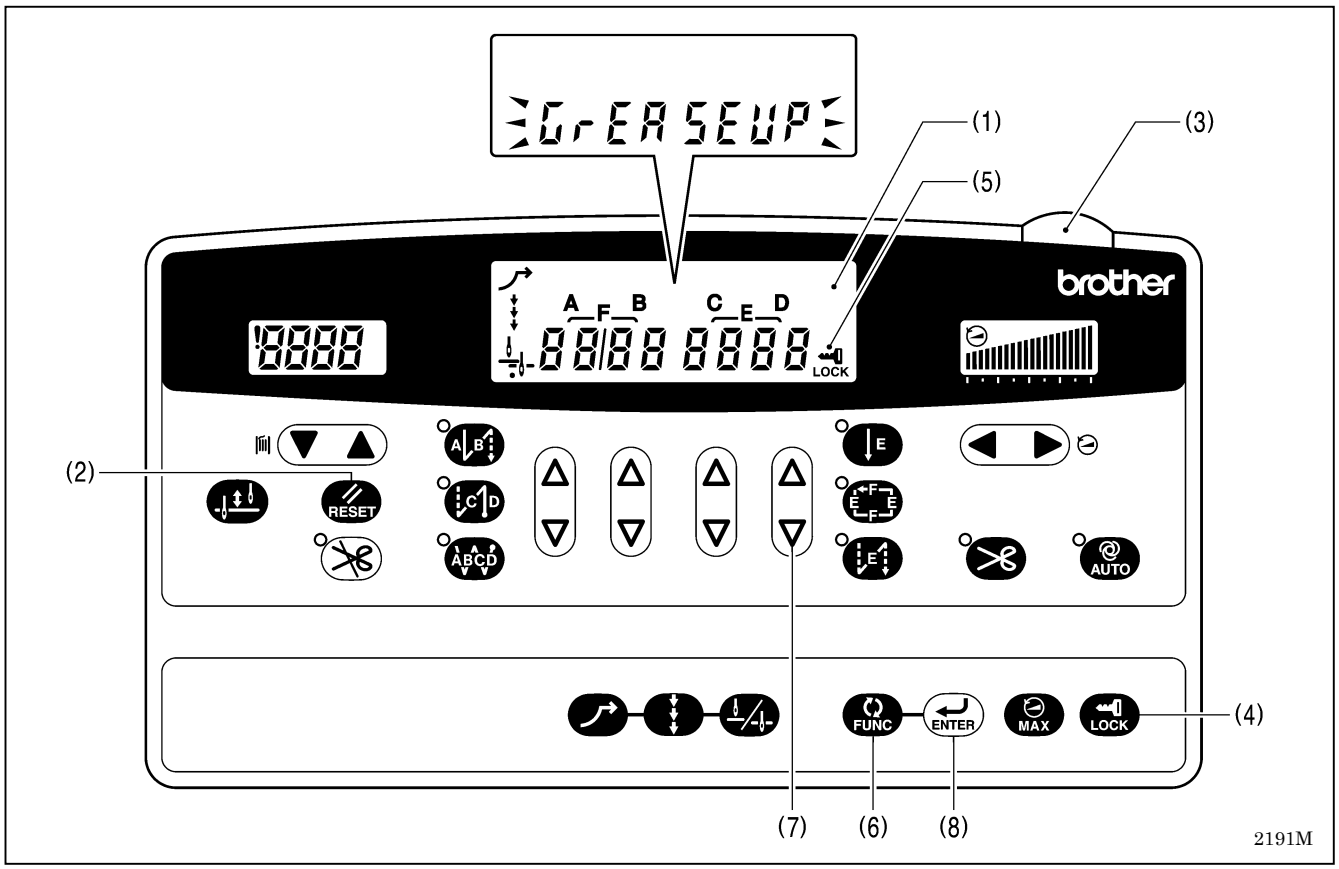
1. Apply grease to the holes of each part as shown in the arrow until a small amount of grease overflows.
2. Tighten the screws to force the grease in.
3. Wipe away any excess grease from around the screws.
4. Apply grease to the meshing areas (▨ areas) of each part.
5. Install each part to the sewing machine.

2319M

8. APPLYING GREASE (-[]3[], []5[] specifications)

8-1. When using the operation panel

If “GrEASEUP” flashes on the main display (1) and a buzzer sounds when the power switch is turned on, it means that grease needs to be applied. (The sewing machine will not operate at this time, even if the treadle is depressed.)
Apply grease as required, while referring to the following for details.



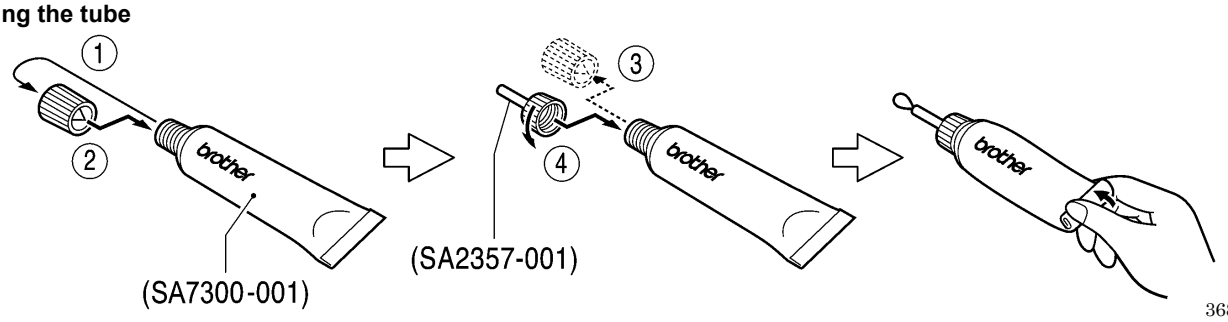
<To continue sewing without applying grease>

1. Press the RESET key (2).
2. The main display (1) will change to stitch number display mode, and sewing will be possible when the treadle is depressed. (The power indicator (3) will keep flashing.)
   NOTE:
   - If you do not apply grease when the “GrEASEUP” notification appears, the notification will continue to appear and the power indicator (3) will flash each time the power is turned on until you reset the notification by carrying out the procedure on the following page.
   - If you continue to use the sewing machine after the “GrEASEUP” notification appears without applying grease (or without carrying out the reset procedure), “Err100” will appear after a certain period of time and the sewing machine will be forcibly prevented from operating for safety reasons.
     If this happens, apply grease and carry out the reset procedure.
     * **If you continue to use the sewing machine after carrying out the reset procedure but without applying grease, problems with the sewing machine may result.**

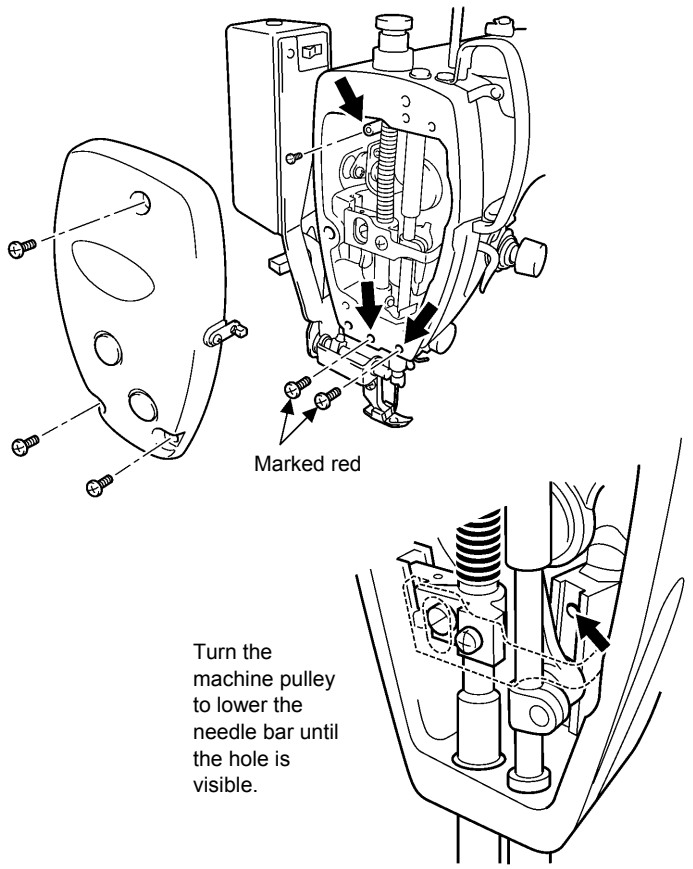
<Applying grease>

Use Brother-specified <GREASE (SA7300-001)>.

Using the tube

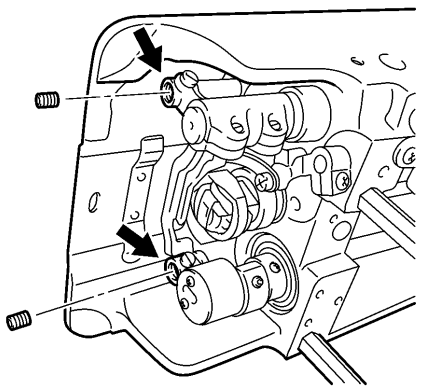


<-[]3[], []5[] specifications>



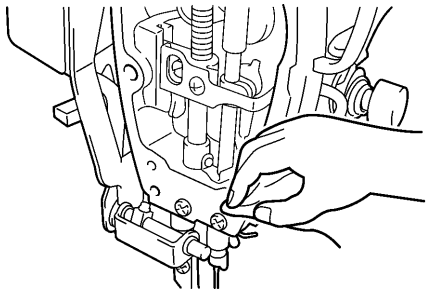
3683M

<-[]5[] specifications>



3684M

1. Turn the power switch to “OFF”.
2. Remove the screws and the set screws.
3. Apply grease to each of the holes until the grease overflows slightly.
4. Tighten the screws and the set screws in order to push the grease in.



3685M

5. Turn the machine pulley by hand to move the needle bar up and down several times in order to disperse the grease.
6. Use a cloth to wipe away any excess grease from around the screws and set screws and from underneath needle bar bush D.
7. Carry out the reset procedure given below.

<Resetting the grease consumption amount>

After the grease has been applied, carry out the following procedure to reset the grease consumption amount.

1. Turn the power switch to “ON”. “GrEASEUP” will flash in the main display (1) and the buzzer will sound.
2. Press the RESET key (2). The main display (1) will change to stitch number display mode.
3. Press and hold the LOCK key (4) for 2 seconds or more.
   The lock icon (5) will switch off and the lock will be released.
4. Press the FUNC (Function) key (6). “n.134 Pxxx” will appear in green in the main display (1).
   (“Pxxx” indicates the grease consumption amount. For example, “P100” means that 100% of the grease has been consumed.)
5. Press the rightmost ▽key (7). The “Pxxx” will change to “P 0”.
6. Press and hold the ENTER key (8) for two seconds or more.
   The buzzer will make a long beep, and then the main display (1) will change to stitch number display mode.
7. Depress the treadle to run the sewing machine for 1 second or more.
8. Turn the power switch to “OFF”. (This completes the reset procedure.)

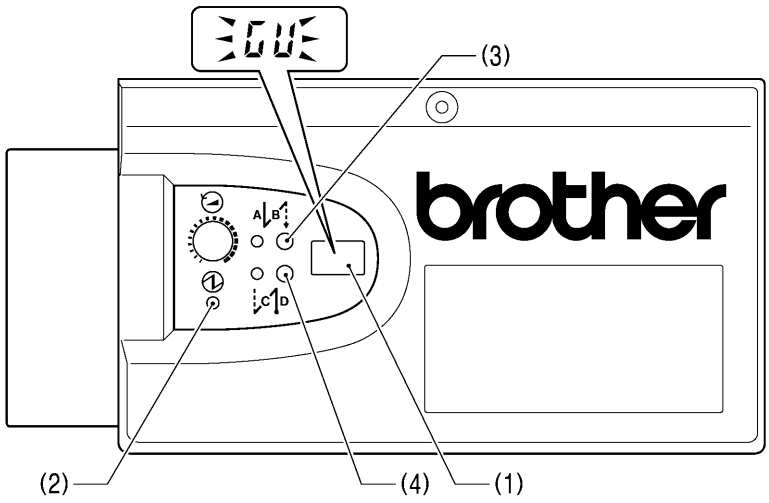
2139M

8-2. When using the control box panel

DANGER

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

If “GU” flashes in the stitch number display (1) on the control box panel when the power switch is turned on, it indicates that it is time for grease to be applied. (The sewing machine will not operate at this time, even if the treadle is depressed.)
Apply grease as required, while referring to the following for details.



3704M

<To continue sewing without applying grease>

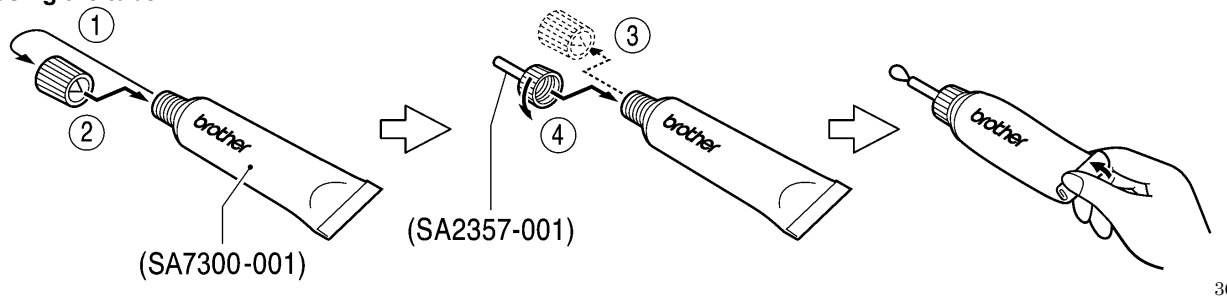
1. Press the start backtack key (3).
2. The “GU” in the stitch number display (1) will stop flashing and disappear, and sewing will be possible when the treadle is depressed.
   (The power indicator (2) will flash.)

NOTE:

- “GU” will appear each time the power is turned on until you apply grease and reset the notification by carrying out the reset procedure on the following page.
- If you continue to use the sewing machine after the “GU” notification appears without applying grease (or without carrying out the reset procedure), “-0” will appear in the stitch number display (1) after a certain period of time and the sewing machine will be forcibly prevented from operating for safety reasons.
  If this happens, apply grease and carry out the reset procedure.
  * **If you continue to use the sewing machine after carrying out the reset procedure but without applying grease, problems with the sewing machine may result.**

<Applying grease>
Use Brother-specified <GREASE (SA7300-001)>.

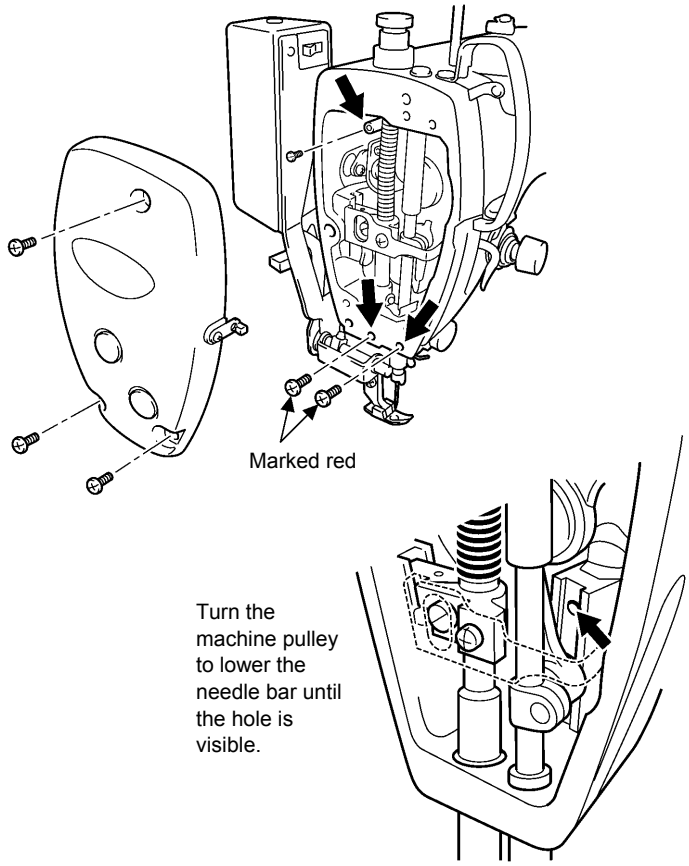
Using the tube



3682M

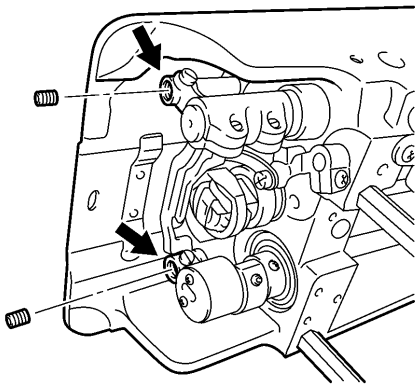
8. APPLYING GREASE (-[]3[], []5[] specifications)

<-[]3[] · []5[] specifications >

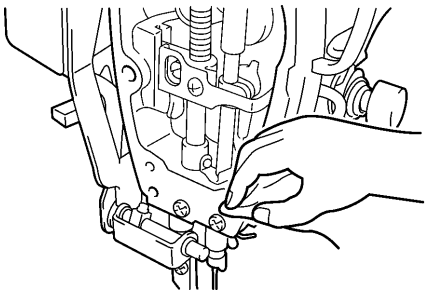


3683M

<-[]5[]specifications >



3684M



3685M

1. Turn the power switch to “OFF”.
2. Remove the screws and the set screws.
3. Apply grease to each of the holes until the grease overflows slightly.
4. Tighten the screws and the set screws in order to push the grease in.
5. Turn the machine pulley by hand to move the needle bar up and down several times in order to disperse the grease.
6. Use a cloth to wipe away any excess grease from around the screws and set screws and from underneath needle bar bush D.
7. Carry out the reset procedure given below.

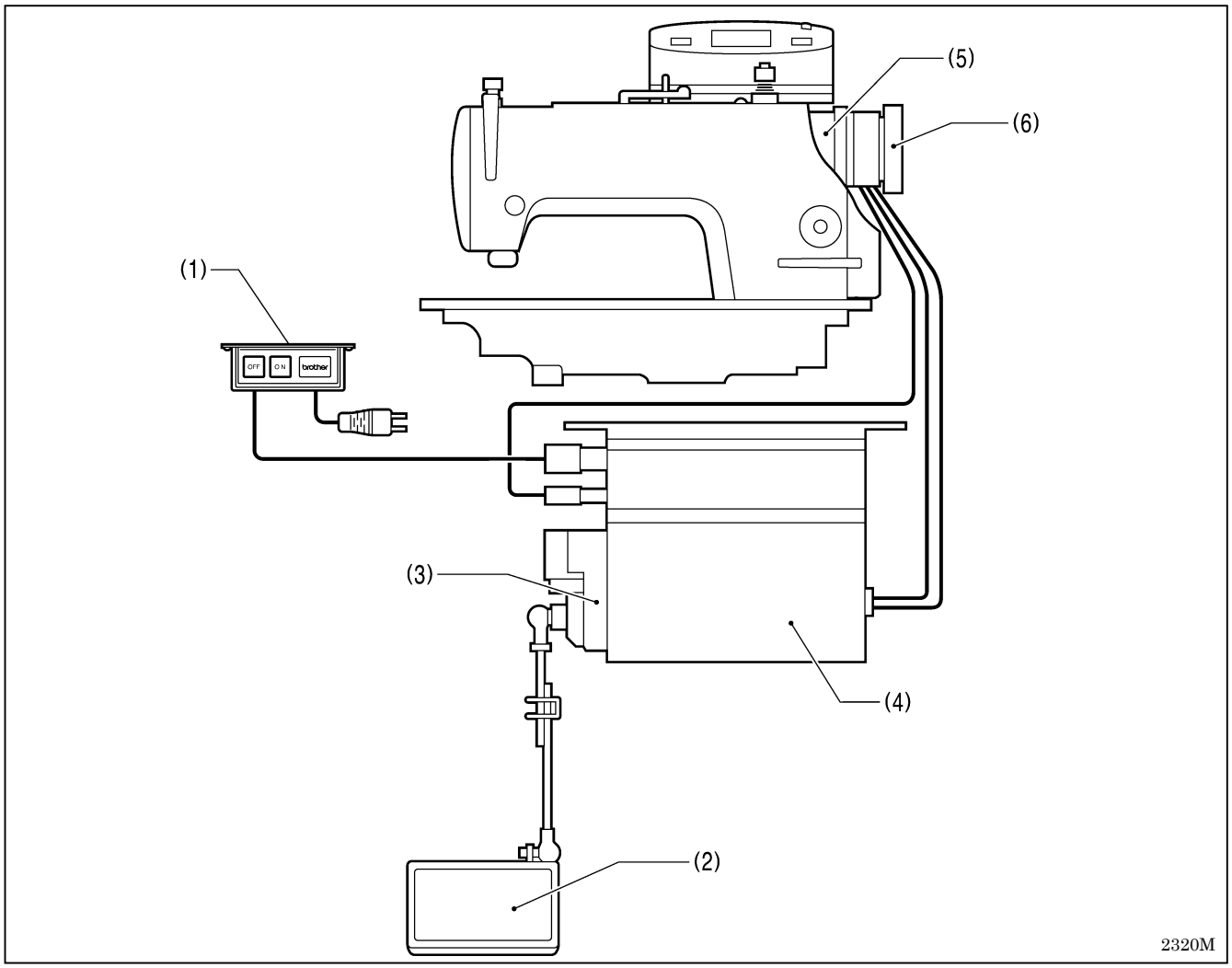
<To continue sewing without applying grease>

After the grease has been applied, carry out the following procedure to reset the grease consumption amount.

1. Set DIP switch -3 inside the control box to OFF.
   (This will cancel the lock so that the functions can be set.)
2. While pressing the end backtack key (4), press the power switch to turn on the power.
3. Press the start backtack key (3) so that “G” is displayed in the top row of the stitch number display.
4. Press the end backtack key (4) to set the value in the bottom row of the stitch number display to “1”.
5. Then, press and hold the end backtack key (4) for 5 seconds or more.
   (The display will turn off.)
6. After this, “Gr” will flash and the reset operation will be complete.
7. After the reset operation is complete, set DIP switch -3 to ON. (The settings will be locked.)

2139M

9. CONTROL SYSTEM



Turn on the power switch (1).

A. When the treadle is depressed

1. When the treadle (2) is depressed, a voltage corresponding to the amount of treadle depression is transmitted by the treadle unit (3) to the control box (4).
2. The DD motor (5) that is directly linked to the sewing machine receives a voltage that corresponds to the treadle depression amount from the control box (4), causing the DD motor (5) to operate at the speed represented by the treadle depression amount, and this makes the sewing machine operate.

B. When the treadle is returned to the neutral position

1. When the treadle (2) is returned to the neutral position (when the operator's foot is removed from the treadle), a signal indicating that the treadle is at the neutral position is transmitted by the treadle unit (3) to the control box (4), and the electrical brake is then applied to slow the DD motor (5).
2. The encoder circuit board that is installed to the DD motor (5) sends a signal to the control box (4) so that the electrical brake is applied in order to stop the sewing machine at the stopping position (needle up or needle down) set by the pulley (6) that is attached to the DD motor (5).

C. When the treadle is depressed backward

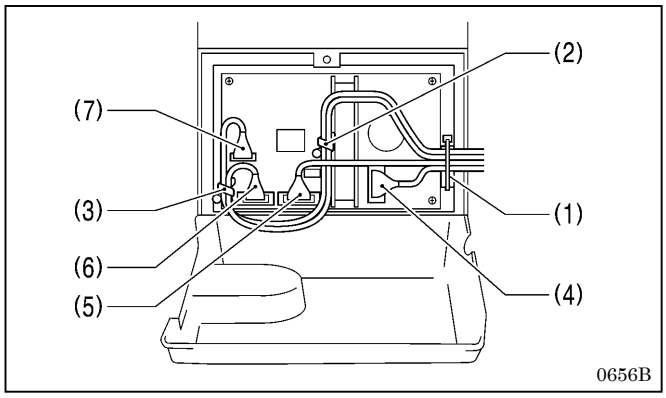
1. When the treadle (2) is depressed backward, a signal indicating thread trimmer operation is transmitted by the treadle unit (3) to the control box (4), and the DD motor (5) slows down to the thread trimming speed (inching speed).
2. The encoder circuit board that is installed to the DD motor (5) sends a signal to the control box (4) so that the electrical brake is applied in order to stop the sewing machine at the needle up stopping position set by the pulley (6) that is attached to the DD motor (5). The thread trimming operation is carried out immediately before the sewing machine stops at the needle up stop position.

10. CONTROL BOX AND MOTOR

10-1. Removing and installing the control box

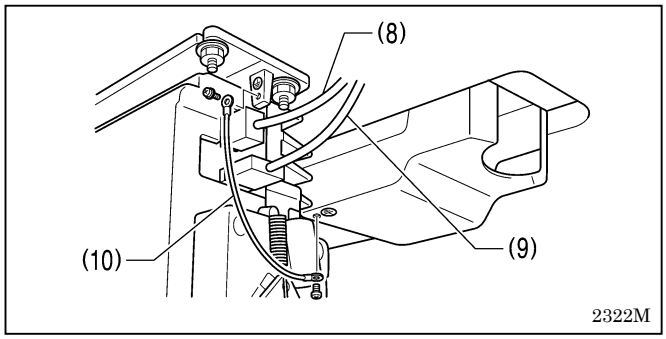
⚠ DANGER

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

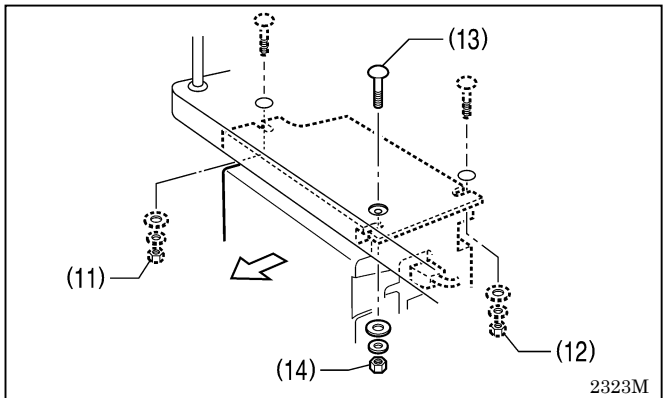


<Removal>

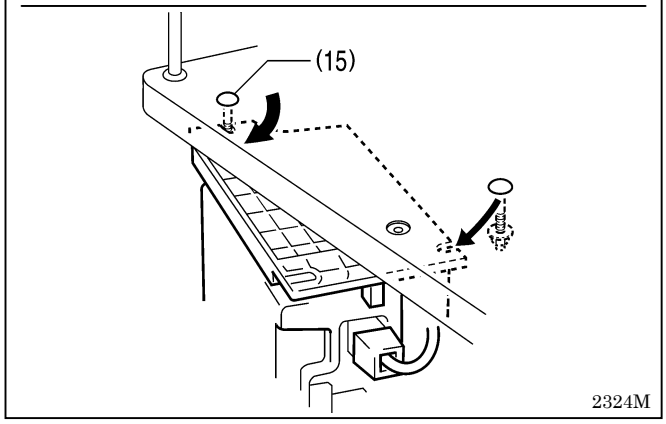
1. Remove the cable tie (1) and the shielded wire clips (2) and (3) in that order, and then disconnect all of the connectors (4) to (7) from the sewing machine.
   * Be careful not to break the pawls of connectors (5), (6) and (7).



2. Disconnect the power supply connector (8) and the motor connector (9).
3. Disconnect the ground wire (10).



4. Loosen the nuts (11) and (12) (without removing them).
5. Remove the bolt (13) and nut (14).



6. Pivot the control box around the bolt (15) and pull it out to remove it from the table.

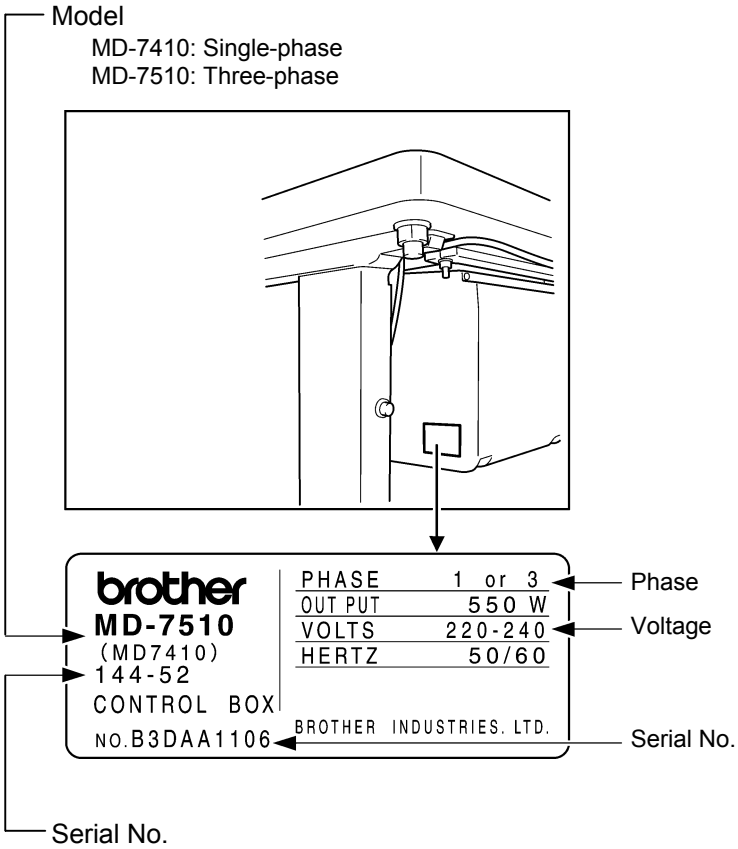
<Installation>

Install by following the removal procedure in reverse.

10-2. Control box and motor rating plate

<Control box>

- Check the phase, voltage and type for the control box.
- Some specifications are identical for both single- and three-phase. (appears on name plate)

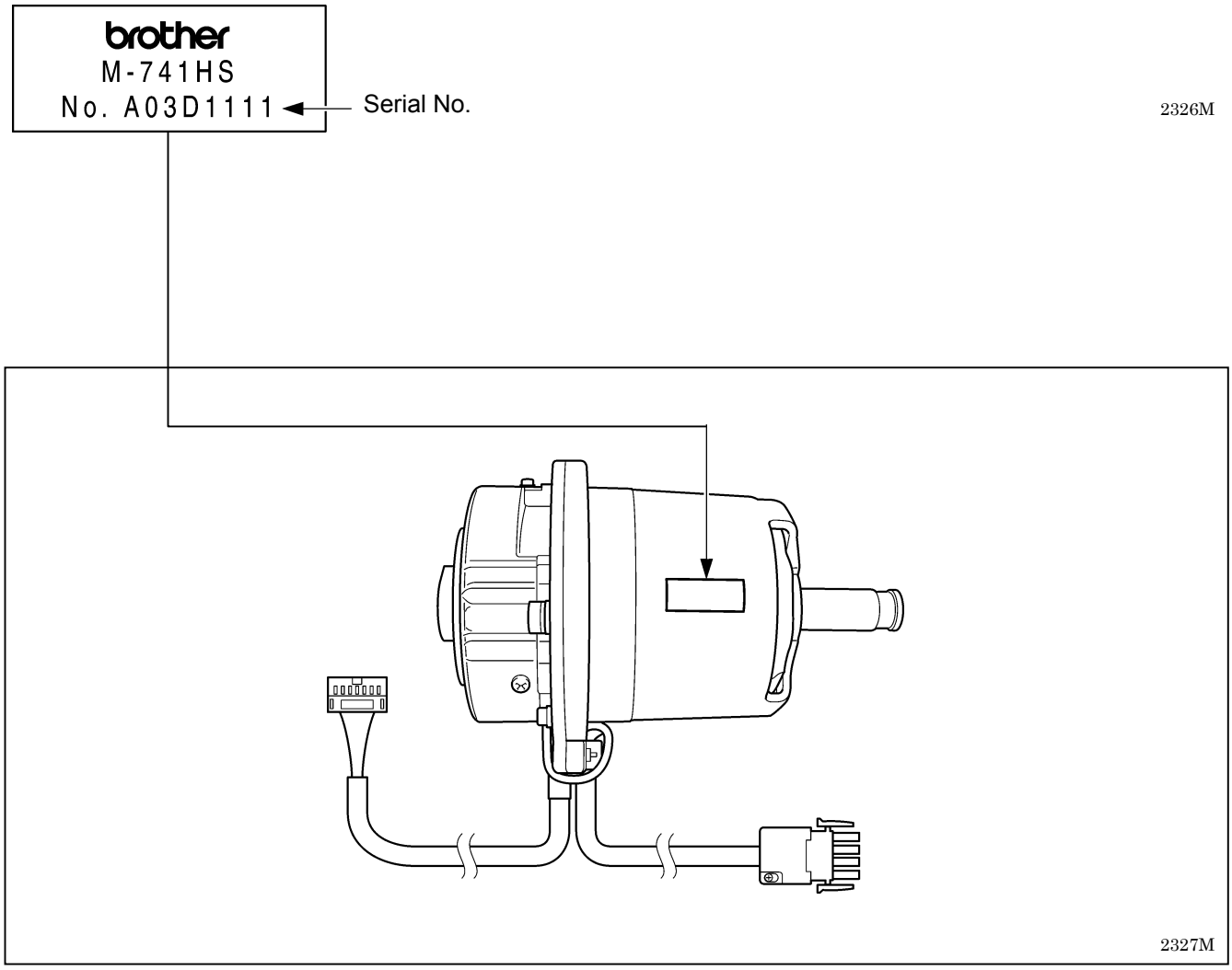


2325M

144-52

Destination	1	Japan
	2	Asia/Middle East
	3	USA/Mexico
	4	Canada
	5	Oceania (C-TICK)
	7	Turkey/ North Africa
	9	China
	L	Europe/Greece (CE)
Power supply voltage	1	100V
	2	110V
	3	200V
	5	220–240V
	8	380–415V
Treadle unit	4	1 forward 1 backward step type
	6	2 forward 2 backward step type
Operation panel	4	External
Sewing machine	1	S-7200A

<Motor>

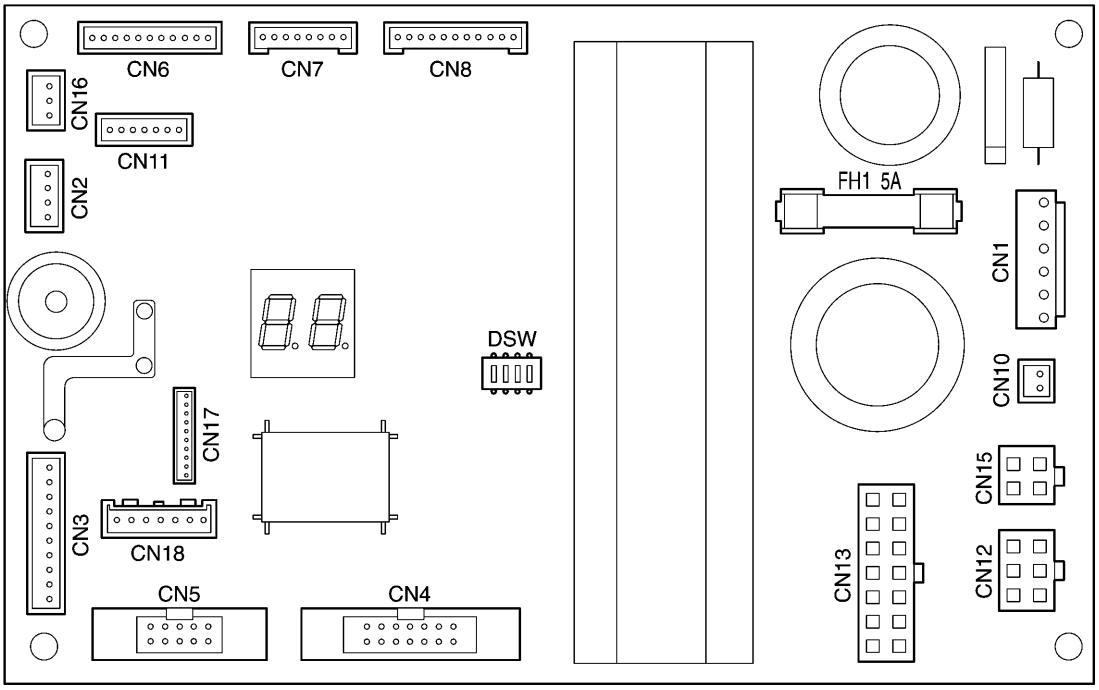


10-3. Control circuit board

DANGER

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

<Name and function of each part>



0657B

Connectors	CN18	Head detector unit connector	Connect to sewing machine connectors.
	CN12	Solenoid-type presser lifter connector	
	CN13	Sewing machine connector	
	CN4	Synchronizer connector	
	CN5	Operation panel connector	
	CN7	Relay connector	Connect to power supply circuit board connectors.
	CN8	Coupler connector	
	CN1	Control power supply connector	Connect to transformer connectors.
	CN2	Treadle connector	Connect to treadle unit connector.
	CN3	Standing operation connector	Connect to plug (sold separately) for standing operation
	CN15	Puller connector	Connect to solenoid for puller or other device.
	CN11	Option connector 1	Connect to sewing speed actuator.
	CN6	Option connector 2	For input/output signals used by external devices
	CN9	Option connector 3	Connect to stitch counter actuator.
	CN10	Cooling fan power supply connector	Only used for three-phase high-voltage specifications.
	CN16	Thermistor connector	Connect to shorted connector when not using three-phase high-voltage specifications.

Fuses	F2 5A	Solenoid power supply fuse (5A)	For preventing overcurrent
	F1 5A	Illumination lamp power supply fuse (5A)	
DIP switch	DSW	DSW	For function selection
LED indicators	LD2	Red LED	Indicates power supply circuit board problems.
	LD1	Green LED	Indicates that the power is on.

Connector CN6

	Signal name		Remarks
1	+5V	DC +5V	
2	IN	Variable signal input	For stitch counting
3	SPSP	Speed command input	[Not used by the S-7200A]
4	STOP	Operation prevention input	L level: Operation prevented
5	ND	Needle down signal output (*)	L level: Needle down stop position
6	NU	Needle up signal output (*)	L level: Needle up stop position
7	ENG	Machine shaft sync signal (*)	45 pulses/stitch
8	STBY	Operation signal output (*)	H level: Operation in progress
9	S0V	0V (GND)	
10	ENC-A	A phase signal output (*)	Encoder A phase (180 pulses/stitch)
11	ENC-B	B phase signal output (*)	Encoder B phase (180 pulses/stitch)

(*) Open collector output

Connector CN9

	Signal name		Remarks
1	+5V	DC +5V	Stitch counter warning LED
2	UNTH_LED	Stitch counter LED signal output	
3	UNTH_SW	Stitch counter switch input signal	Stitch counter actuator
4	S0V	0V (GND)	
5	IN1	Variable input signal 1	
6	IN2	Variable input signal 2	

Connector CN11

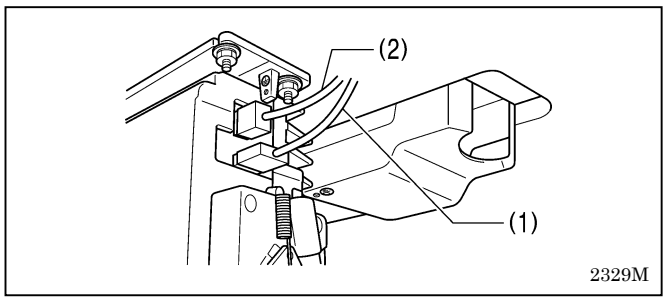
	Signal name		Remarks
1	+5V	DC +5V	
2	LED1	Option signal output 1	
3	LED2	Option signal output 2	
4	LEFT_UP_SW	Option signal input 1	Sewing speed actuator (high speed)
5	RIGHT_UP_SW	Option signal input 2	Sewing speed actuator (medium speed)
6	RESET_SW	Option signal input 3	Sewing speed actuator (low speed)
7	S0V	0V (GND)	

10-4. Checking the motor and power supply

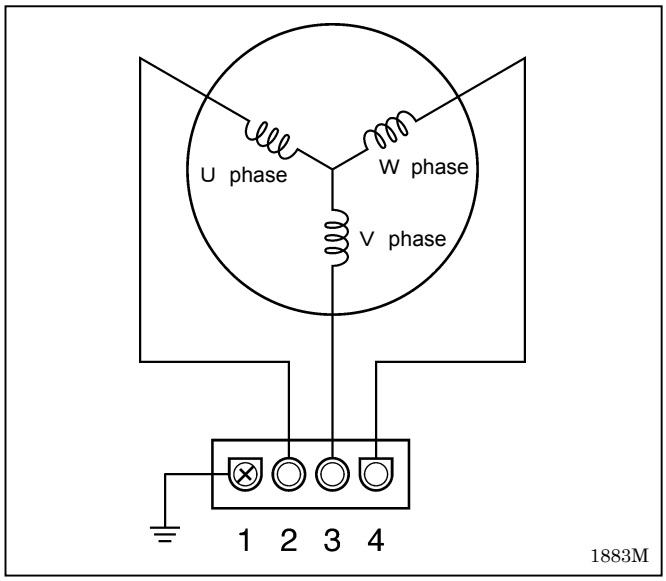
⚠ CAUTION

Turn off the power switch and disconnect the power cord from the wall outlet before carrying out these operations. The machine may operate if the treadle is depressed by mistake, which could result in injury.

If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.



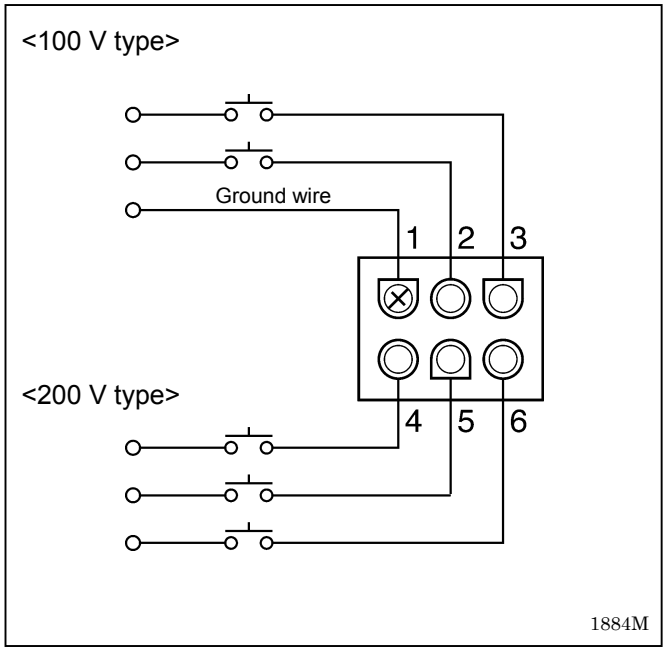
<Motor>



1. Disconnect the motor connector 4P (1) from the control box.
2. Measure the resistance of the motor connector (1) using an ohmmeter in the x 1 range.
   If the value is as shown in the table below, the connector is normal.

Between 2–3	Approx. 1.6Ω
Between 3–4	
Between 4–2	

<Power switch>



1. Disconnect the power supply connector 6P (2) from the control box.
2. Turn on the power switch.
3. Measure the voltage at the power supply connector (2) using the AC voltage range of a multimeter, and check that the voltage is within the allowable range for the specified voltage rating.

100 V type (100–120 V)

Measure the AC voltage between terminals 2–3.

200 V type (200–240 V)

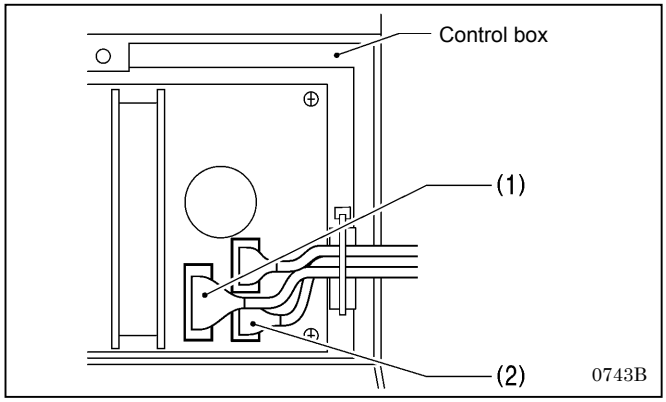
[A] For three-phase
Measure the AC voltage between terminals 4–5, 5–6 and 6–4.

[B] For single-phase
Measure the AC voltage between terminals 4–6.

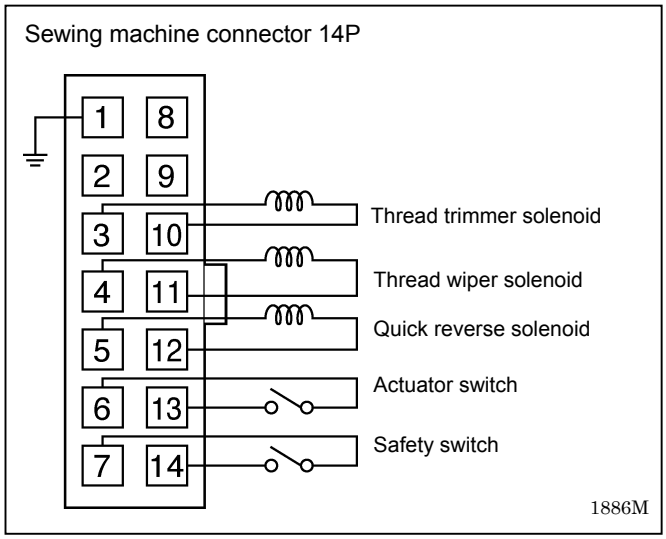
10-5. Checking the solenoids

DANGER

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.



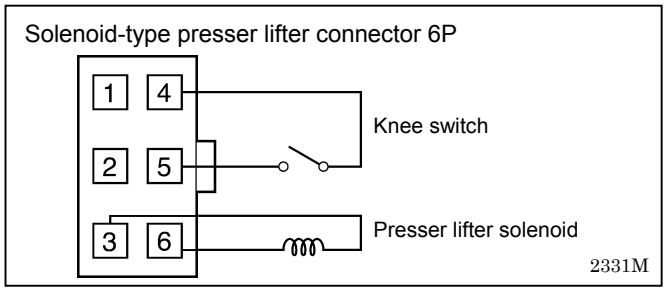
<Machine head>



1. Disconnect the sewing machine connector 14P (1) from the control circuit board.
2. Measure the resistance of the sewing machine connector (1) using an ohmmeter in the x 1 range.
   If the values are as shown in the table below, the connector is normal.

Between 3–10	Thread trimming solenoid: Approx. 7.6Ω
Between 4–11	Thread wiper solenoid: Approx. 5.7Ω
Between 5–12	Quick reverse solenoid: Approx. 4.8Ω
Between 6–13	When actuator is pressed: 0Ω
	When actuator is released: ∞ Ω
Between 7–14	When machine head is upright (switch ON): 0 Ω
	When machine head is tilted back (switch OFF): ∞ Ω

<Solenoid-type presser lifter connector>



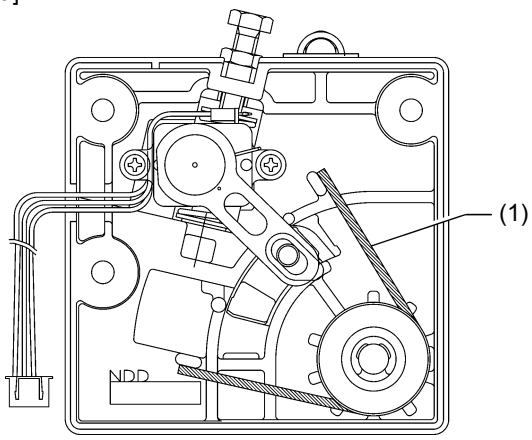
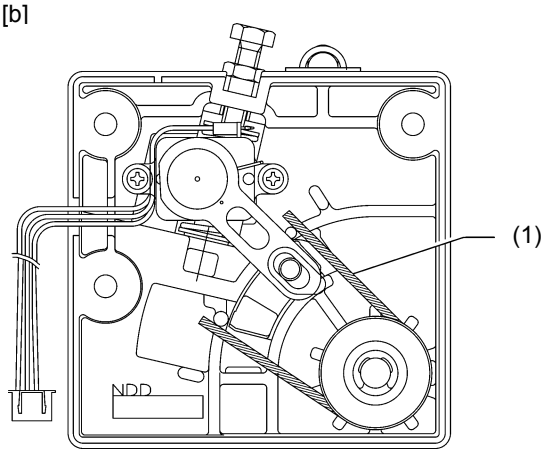
1. Disconnect the solenoid-type presser lifter connector 6P (2) from the control circuit board.
2. Measure the resistance of the solenoid-type presser lifter connector (2) using an ohmmeter in the x 1 range.
   If the values are as shown in the table below, the connector is normal.

Between 3–6	Presser lifter solenoid: Approx. 9.6 Ω
Between 4–5	When knee switch is pressed: 0 Ω
	When knee switch is released: ∞ Ω

11. TREADLE UNIT ASSEMBLY

11-1. Types

- The two types of treadle unit that are available are the type that controls the automatic presser foot lifter and the type that does not.
- You can switch between the two types by <A> changing the hooking position of the spring (1) inside the treadle unit; <B> setting DIP switch 2; and <C> setting the treadle stroke.

Specifications	Treadle unit G	Treadle unit H
Operation	Does not control automatic presser lifter	Controls automatic presser lifter
<A> Difference in spring position	[a]  1839M	[b]  1840M
<B> DIP switch setting	DIP switch 2: OFF <When depressing the treadle forward> The presser foot lifter control signal is not output when the treadle is being depressed.	DIP switch 2: ON <When depressing the treadle forward> The automatic presser foot lifter signal is output at the position before the treadle depression force suddenly changes.
<C> Signal setting	Carry out the setting in “Setting method for standard depression strokes” on page 58. Set the neutral position, maximum forward position and maximum backward position.	Carry out the setting in “Setting method for standard depression strokes” on page 58. Set the neutral position, maximum forward position and maximum backward position. The first modulation position for the treadle depression force is set automatically.
<D> Depression force	<When depressed forward and depressed backward> The depression force hardly changes at all from the start of depression until full depression.	<When depressed forward and depressed backward> The depression force suddenly changes at a point between the start of depression and full depression.
<E> Depression signal	< When depressed forward > The sewing machine starts. < When depressed backward > The sewing machine starts. (NOTE 1)	<When depressed forward and depressed backward> An automatic presser lifter signal is output at the point before the depression force suddenly changes, and the sewing machine starts at the point after the depression force suddenly changes.

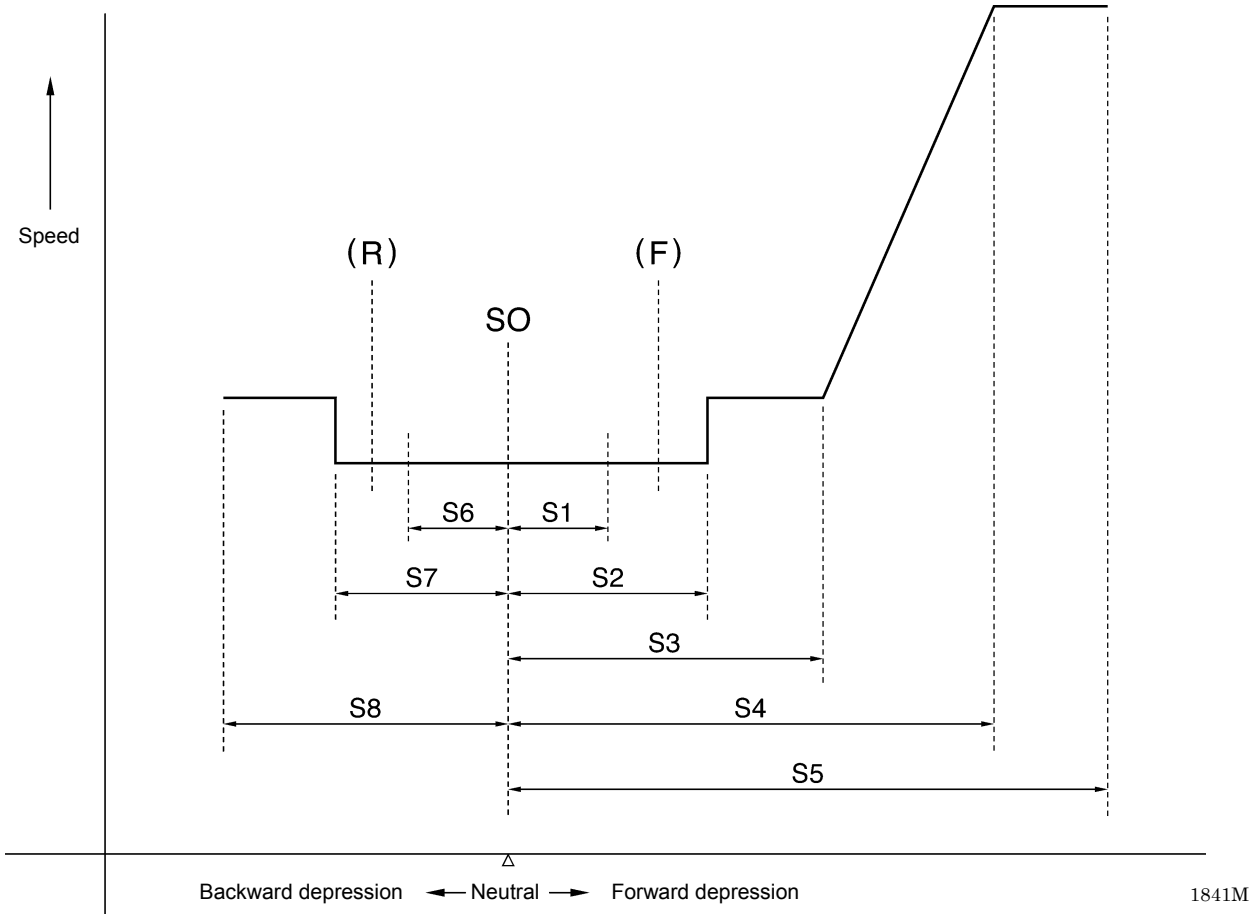
(NOTE 1) The presser foot lifter control signal is output while the treadle is depressed backward. However, if DIP switch 1 is set to OFF, the presser foot lifter control signal is not output when the treadle is depressed backward after the knee switch has been used to raise the presser foot.
Furthermore, if Function No. 41 is set to “1”, the presser foot lifter control signal is not output when the treadle is depressed backward.

11-2. Standard setting values

Function No.	Symbol (diagram below)	Specifications	Treadle unit G		Treadle unit H	
		Operation	Does not control automatic presser lifter		Controls automatic presser lifter	
		Spring position setting	No forward/back 1st step modulation (Figure [a] on previous page)		Forward/back 1st step modulation (Figure [b] on previous page)	
		Function	Length from S0 (mm)	Force (N)	Length from S0 (mm)	Force (N)
-	S0	Neutral point	0	-	0	-
82	S1	Forward automatic presser lifter operating point	-	-	2 (NOTE 1)	10
83	S2	Low speed operation starting point	3	10	5	25
84	S3	Speed change starting point	6	-	7	-
85	S4	Maximum speed reaching point	S5-1	-	S5-1	-
-	S5	Maximum forward depression point	14.5	12	14.5	32
81	S6	Back automatic presser lifter operating point	-	-	2 (NOTE 2)	14
80	S7	Thread trimmer operating point	5	22	5	35
-	S8	Maximum back depression point	8	28	8	43

(NOTE 1) Setting is enabled when DIP switch 1 is set to ON and Function No. 13 is set to “1”.
(NOTE 2) Setting is enabled when Function No. 12 is set to “0”.

- When the connecting rod installation position is on the inside, the measurement value is the amount of movement of the treadle from the neutral position to the forward position and to the backward position.
- For treadle unit -H, the point of change (F) in the forward depression force is between S1 and S2, and the point of change (R) in the backward depression force is between S6 and S7.

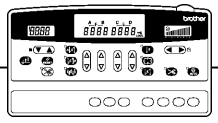


11-3. Setting method for standard depression strokes

⚠ CAUTION

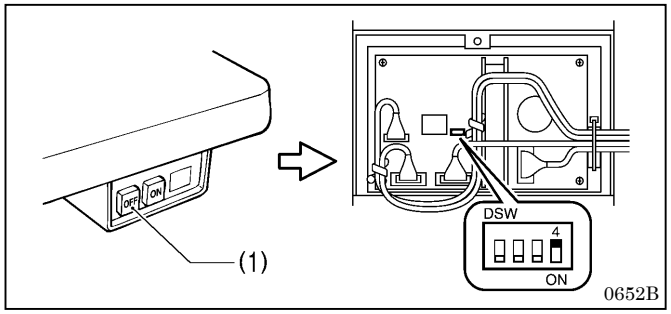
Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

- When the specifications of the treadle unit are changed or if the treadle unit or control circuit board are replaced, it will be necessary to make new settings according to the procedure described below.
  Use the following procedure to set the operating positions for the depression stroke.
- For sewing machines with operation panel, make the settings using the operation panel. (Refer to “A. For the operation panel”.)
- For sewing machines without operation panel, make the settings using the control box panel. (Refer to “B. For the control box panel”.)



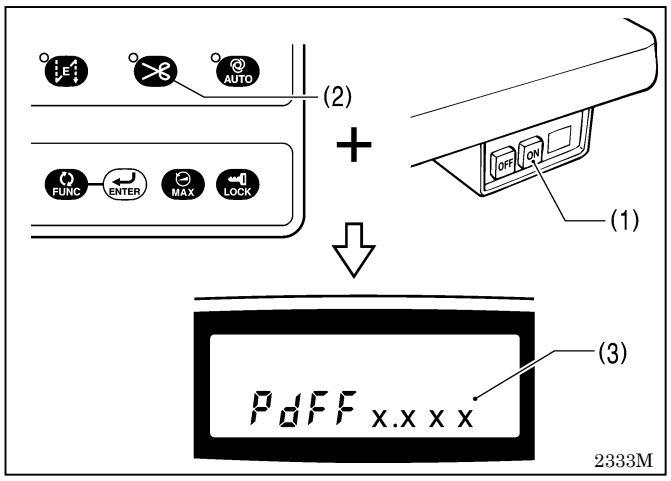
A. For the operation panel

1) Signal setting entry



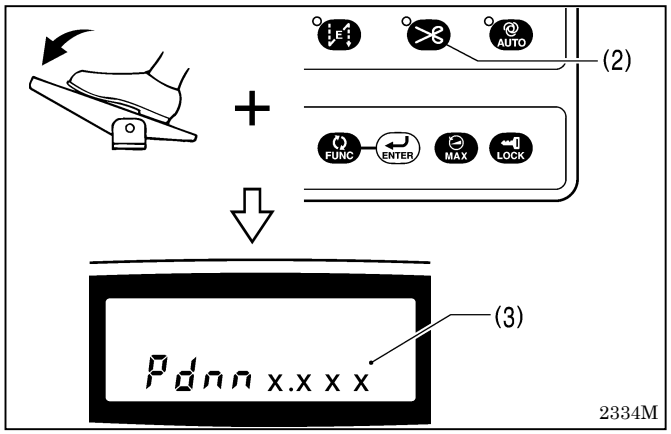
1. Turn off the power switch (1).
2. Set DIP switch No.4 to ON.

3192M



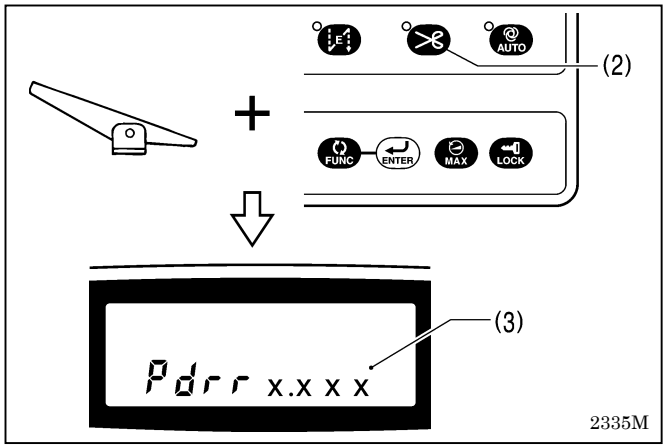
3. While pressing the thread trimming key (2), turn on the power switch (1).
   “PdFF x.xxx” will appear in the main display (3).
   (x.xxx indicates the depression voltage.)

2) Memorizing the maximum forward position



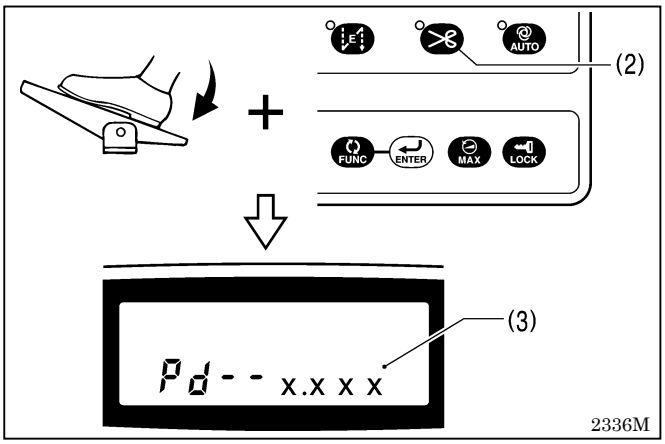
With the treadle depressed forward to the maximum forward position, press the thread trimming key (2).
“Pdnn x.xxx” will appear in the main display (3).

3) Memorizing the neutral position



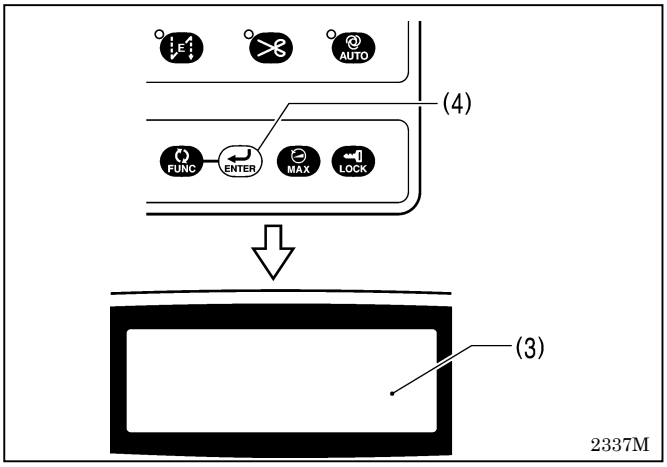
With your foot released from the treadle, press the thread trimming key (2).
"Pdrr x.xxx" will appear in the main display (3).

4) Memorizing the maximum backward position

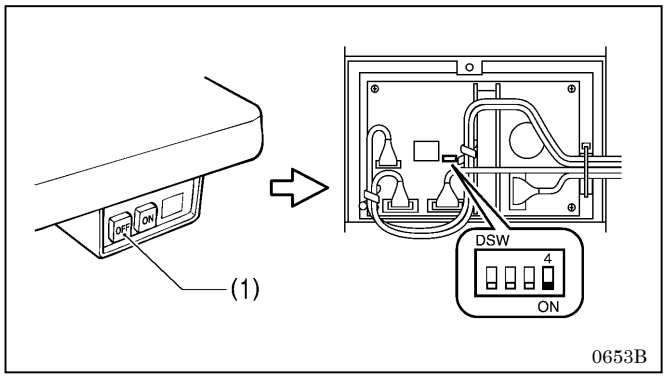


With the treadle depressed backward to the maximum backward position, press the thread trimming key (2).
“Pd-- x.xxx” will appear in the main display (3).

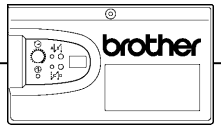
5) Completion of setting



1. Press the ENTER key (4).
   The buzzer will sound and the main display (3) will switch off.
   NOTE:
   If you do not press the ENTER key (4), the settings will not be memorized.

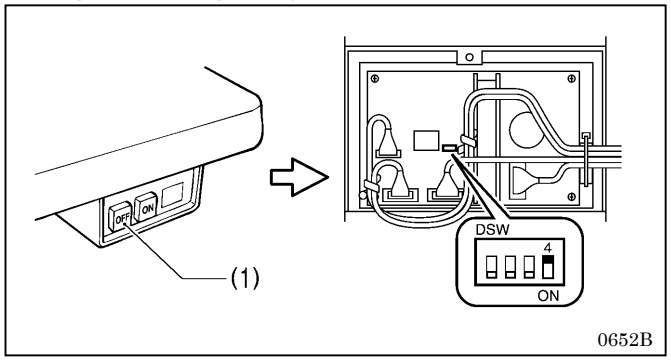


2. Turn off the power switch (1).
3. Set DIP switch No.4 to OFF.



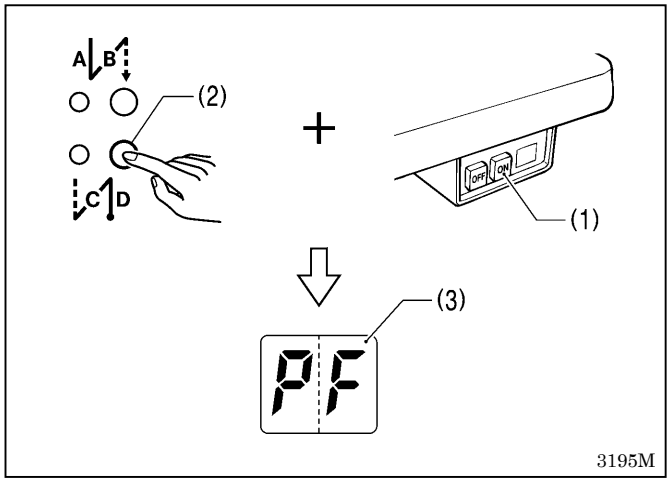
B. For the control box panel

1) Signal setting entry



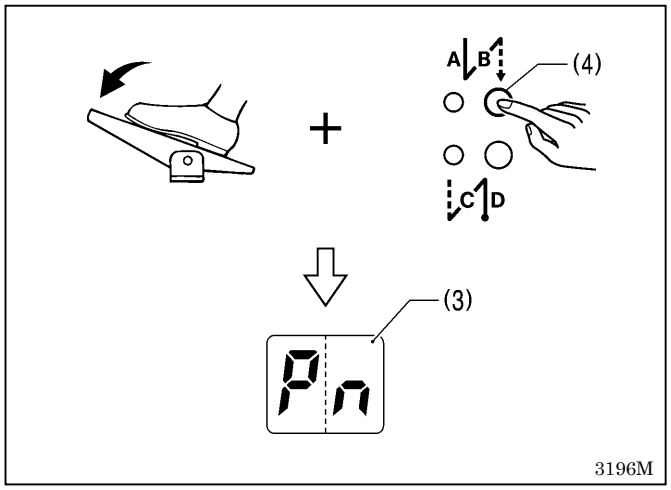
1. Turn off the power switch (1).
2. Set DIP switch No.4 to ON.

3193M



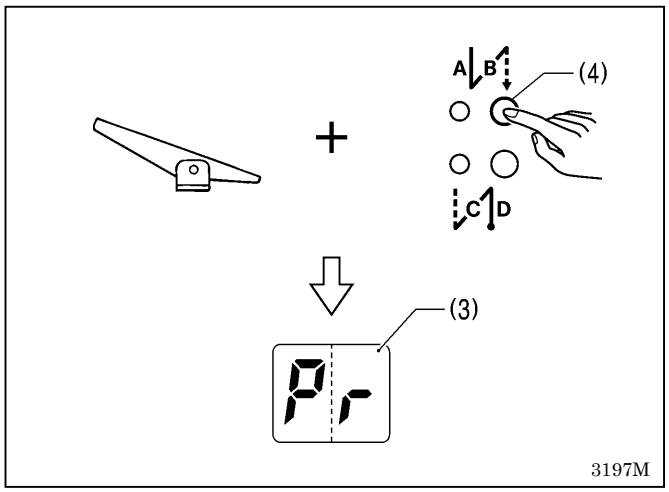
3. While pressing the end backtack key (2), turn on the power switch (1).
   "PF" will appear in the stitch number display (3).

2) Memorizing the maximum forward position



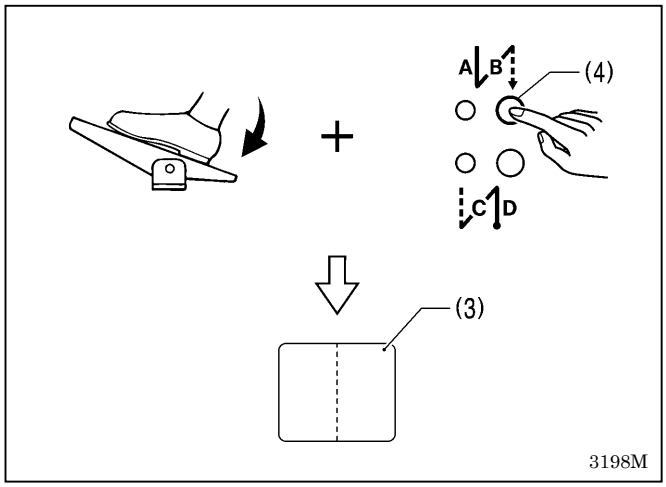
<u>With the treadle depressed forward to the maximum forward position</u>, press the start backtack key (4).
"Pn" will appear in the stitch number display (3).

3) Memorizing the neutral position



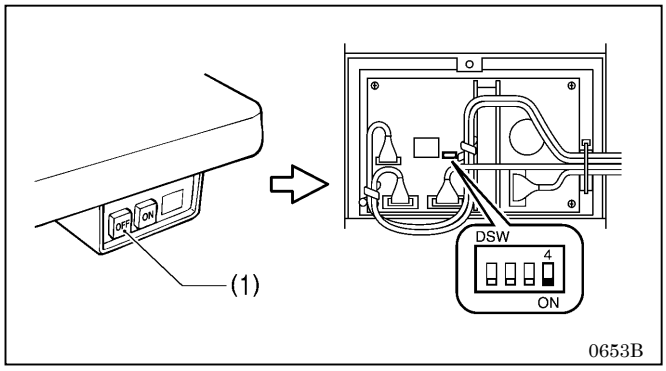
With your foot released from the treadle, press the start backtack key (4).
"Pr" will appear in the stitch number display (3).

4) Memorizing the maximum backward position



With the treadle depressed backward to the maximum backward position, press the start backtack key (4).
The stitch number display (3) will switch off.

5) Completion of setting



1. Turn off the power switch (1).
2. Set DIP switch No.4 to OFF.

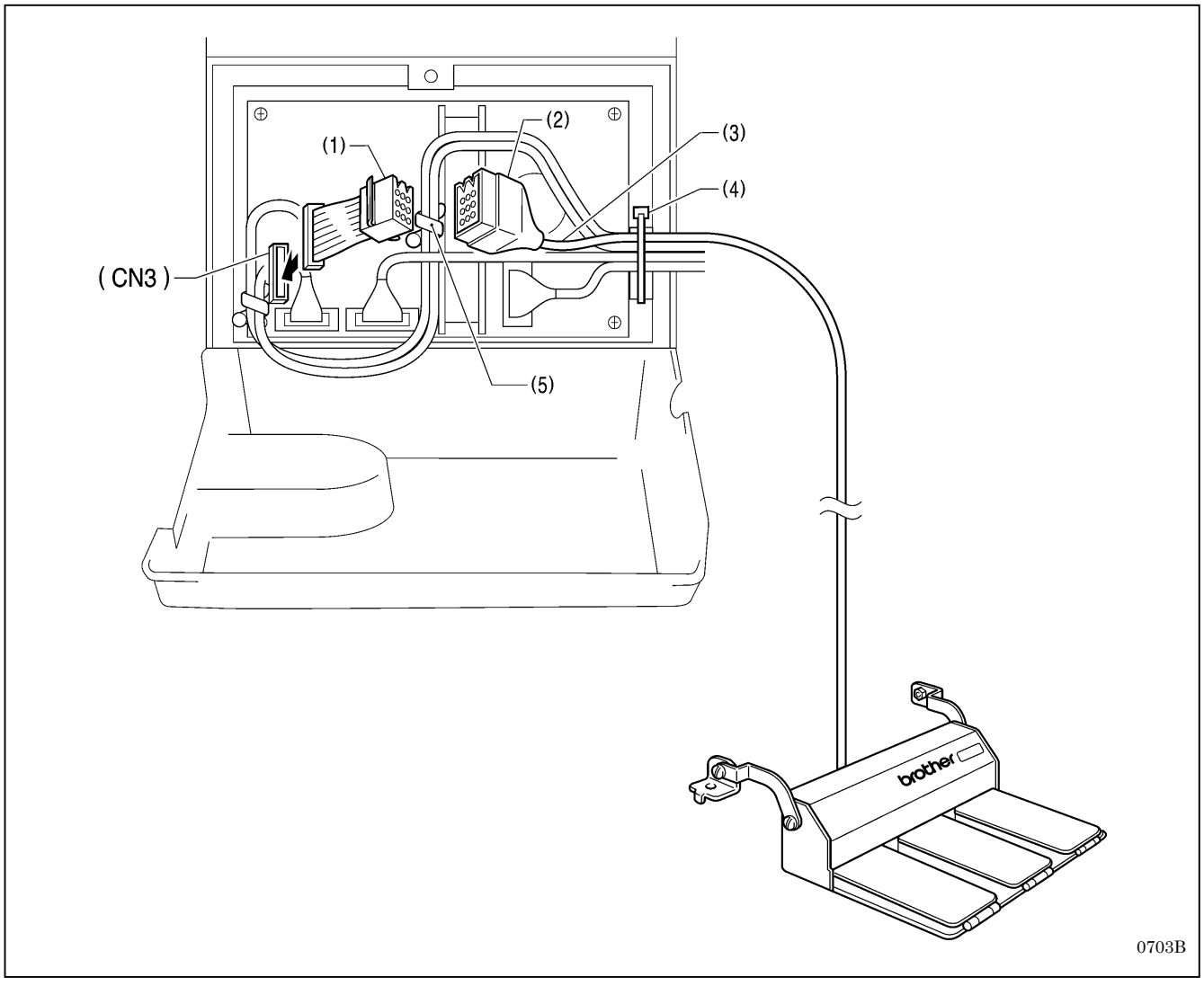
12. STANDING OPERATION PEDAL

The foot plug assembly CDD (J04099-001) that is sold separately is required.

12-1. Installing the foot plug

DANGER

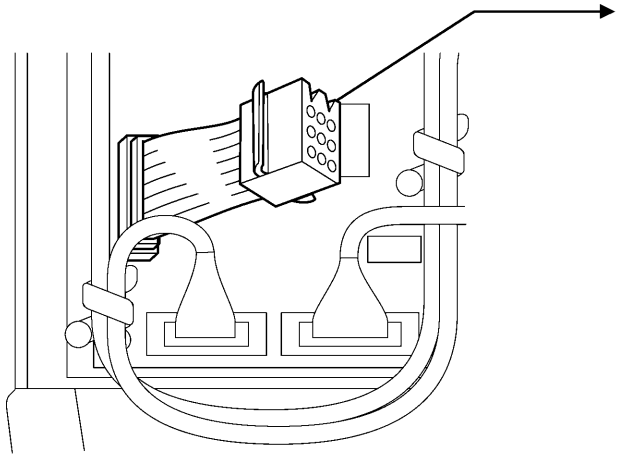
Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.



1. Connect the foot plug (1) to connector CN3 on the control circuit board.
2. Connect the standing pedal connector (2) to the foot plug (1).
3. Secure the cord (3) of the standing pedal with the shielded wire clip (5) and the cable tie (4).

12-2. Connectors

<At foot plug>



No.	Standing operation pedal 9P connector
1	DC+8 V
2	High-speed switch
3	Thread trimmer switch
4	SOV
5	Spare
6	Low-speed switch
7	Presser foot switch
8	Variable speed input
9	Ground

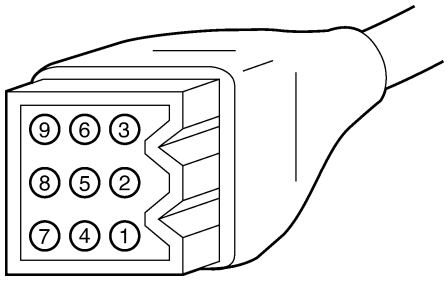
0702B

<At pedal>

NOTE:

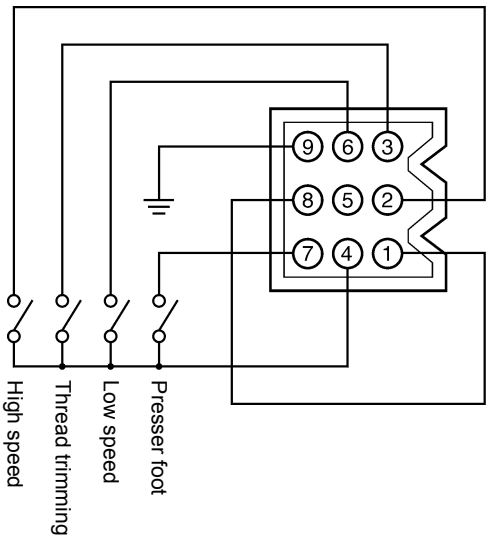
Connector types

Manufacturer	Connector No.	Connector terminal
MOLEX	1292 P	1380 TL

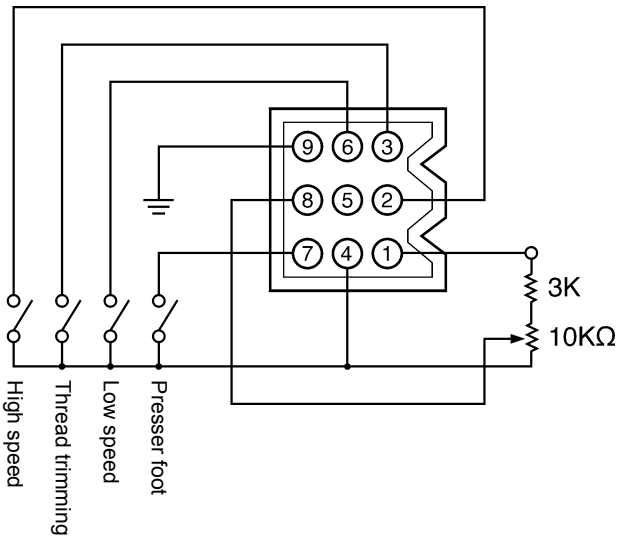


1867M

<A> Two-step pedal



<B> Variable speed pedal



1868M

13. TROUBLESHOOTING

- Please check the following points before calling for repairs or service.
- If the following remedies do not fix the problem, turn off the power switch and consult a qualified technician or the place of purchase.

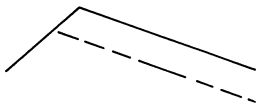
⚠ DANGER

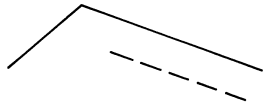
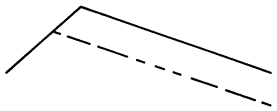
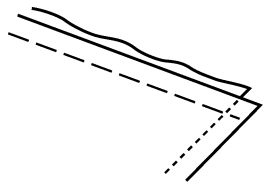
Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

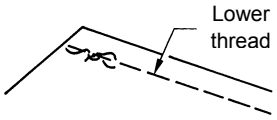
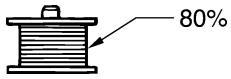
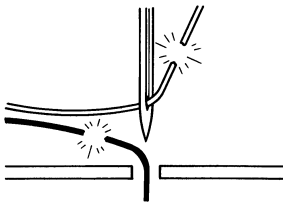
⚠ CAUTION

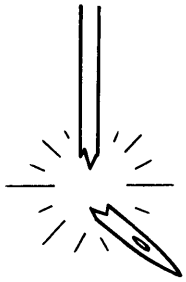
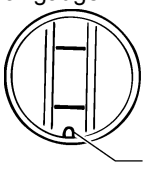
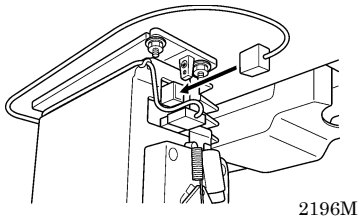
Turn off the power switch and disconnect the power cord before carrying out troubleshooting.
The machine may operate if the treadle is depressed by mistake, which could result in injury.

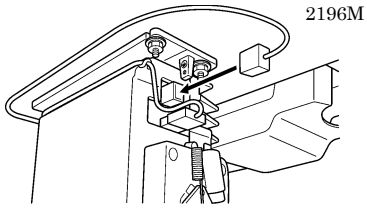
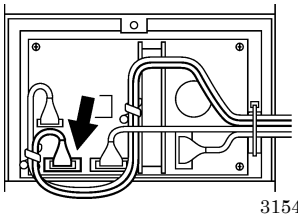
13-1. Sewing

	Problem	Possible cause	Page
1	Upper thread is not tight. 0573M	• Is the upper thread tension too weak, or is the lower thread tension too strong? Adjust the upper thread tension or lower thread tension. • Is the needle and feed timing correct? Advance the needle timing.	Instruction manual
2	Lower thread is not tight. 0574M	• Is the lower thread tension too weak, or is the upper thread tension too strong? Adjust the lower thread tension or upper thread tension.	Instruction manual
3	Loops appear in seam. 0977M	• Is the thread path not smooth enough? Use a file with a fine grain or sandpaper to polish smooth the thread path. • Is the bobbin not turning smoothly? Pull out the lower thread to check that there is no slackness in the thread tension, or replace the bobbin or bobbin case.	
4	Skipped stitches occur while sewing  0470M	• Is the needle tip bent? Is the needle tip blunt? If the needle tip is bent or blunt, replace the needle. • Is the needle properly installed? If it is incorrect, install the needle correctly. • Is the machine properly threaded? If it is incorrect, thread the thread correctly. • Is the presser foot pressure too weak? Adjust the presser foot pressure. • Is the needle too thin? Replace the needle with a needle that is one rank thicker. • Is the presser foot too high? Adjust the height of the presser foot. • Is the thread take-up spring too weak? Adjust the tension of the thread take-up spring. • Is the needle and rotary hook timing correct? Adjust the height of the needle bar. Adjust the clearance between the needle and the tip of the rotary hook.	Instruction manual Instruction manual Instruction manual 27 26 30 31

	Problem	Possible cause	Page
5	Skipped stitches at sewing start Thread unravelling at sewing start  0749M	• Is the thread take-up spring tension too strong? Reduce the tension of the thread take-up spring. • Is the thread take-up spring operating range too large? Lower the position of the thread take-up spring. • Are the trailing lengths of the upper threads too short after thread trimming? Adjust the pretension. • Are the threads not being trimmed cleanly? Sharpen the fixed knives, or replace the fixed and movable knives if necessary. • Is the needle too wide? Try using a needle with a count that is one lower than the current needle. • Is the length of thread trailing out from the bobbin case after thread trimming too short. If the bobbin is spinning loosely, replace the anti-spin spring in the bobbin case. • Is the sewing speed too fast at the sewing start? Use the slow start feature. • Is the needle up stop position too high? Adjust the needle up stop position.	26 26 Instruction manual Instruction manual Instruction manual 34, 35
6	Uneven seam  0473M	• Is the presser foot pressure too weak? Adjust the presser foot pressure. • Is the feed dog too low? Adjust the feed dog height. • Is the bobbin scratched? If the bobbin is damaged, smooth it with an oiled grindstone or replace it.	Instruction manual 28
7	Large degree of puckering (excess tension) 0978M	• Is the upper thread tension too strong? Make the upper thread tension as weak as possible. • Is the lower thread tension too strong? Make the lower thread tension as weak as possible. • Is the needle tip blunt? Replace the needle if it is blunt. • Is the needle too thick? Replace with as thin a needle as possible. • Are the thread take-up spring tensions too strong? Make the thread take-up spring tension as weak as possible. • Is the thread take-up spring operating range too large? Lower the position of the thread take-up spring to as low a position as possible. • Is the presser foot pressure too strong? Adjust the presser foot pressure. • Is the sewing speed too fast? Use the sewing speed control keys to gradually reduce the sewing speed. • Is the angle of the feed dog correct? Tilt the front of the feed dog down slightly.	Instruction manual Instruction manual 26 26 Instruction manual Instruction manual 29
8	Material slippage  0750M	• Is the presser foot pressure too strong? Adjust the presser foot pressure.	Instruction manual

	Problem	Possible cause	Page
9	Lower thread is tangled at the sewing start. Spinning of bobbin during thread trimming  0751M	• Is the bobbin spinning direction correct when the lower thread is being pulled? Set the bobbin so that it turns in the opposite direction to the rotary hook. • Is there too much thread wound onto the bobbin? The bobbin winding amount should not be more that 80 %.  2124M • Is the anti-spin spring attached? Attach the anti-spin spring. • Is the bobbin turning smoothly? If the bobbin is not turning smoothly, replace the bobbin. • Is a bobbin other that the light-alloy bobbins specified by Brother being used? Use only bobbins which are specified by Brother.	Instruction manual Instruction manual Instruction manual Instruction manual
10	Upper and lower threads are breaking.  0471M	• Is the needle tip bent? Is the needle tip blunt? If the needle tip is bent or blunt, replace the needle. • Is the needle properly installed? If it is incorrect, install the needle correctly. • Is the machine properly threaded? If it is incorrect, thread the thread correctly. • Is the rotary hook sufficiently lubricated? (-[]0[], []3[] specifications) If the oil gauge is down to the lower reference line in the oil gauge window, add more oil. • Is the upper or lower thread tension too weak or too strong? Adjust the upper thread or lower thread tension. • Is the upper thread may be loose because the thread take-up spring operating range is too small? Adjust the position of the thread take-up spring. • Is the rotary hook, feed dog or other part damaged? If they are damaged, smooth them with an oiled grindstone or replace the damaged parts. • Is the thread path damaged? If the thread path is damaged, smooth it with sandpaper or replace the damaged part.	Instruction manual Instruction manual Instruction manual Instruction manual 26
11	Incorrect thread trimming (Upper and lower threads are both not being trimmed)	• Is the fixed knife or movable knife damaged or worn? Replace the fixed knife or the movable knife.	38
12	Incorrect thread trimming (Upper thread or lower thread is not being trimmed)	• Is the needle properly installed? If it is incorrect, install the needle correctly. • Is the fixed knife or movable knife blunt? Replace the fixed knife or the movable knife.	Instruction manual 38

	Problem	Possible cause	Page
13	Broken needles  0469M	• Is the material being pushed or pulled with excessive force during sewing? • Is the needle properly installed? If it is incorrect, install the needle correctly. • Is the needle bent, is the needle tip blunt, or is the needle hole blocked? Replace the needle. • Is the needle and rotary hook timing correct? Adjust the height of the needle bar. Adjust the clearance between the needle and the tip of the rotary hook. • Is the needle timing too advanced with respect to the feed dog? Retard the needle timing. **Caution** • It is extremely dangerous to leave any pieces of broken needle sticking in the material. If the needle breaks, search for all pieces until the whole of the needle is found again. • Furthermore, we recommend that through steps be taken to account for such needles to comply with product liability regulations.	Instruction manual 30 31 30
14	Oil gauge (1) is not visible in oil gauge window.  (1) 2195M	• Is the oil tank empty? (-[]0[], []3[] specifications) Fill the oil tank with oil.	Instruction manual
15	Machine does not operate when power is turned on and treadle is pressed.	• Is the power supply connector disconnected from the control box? Insert the connector securely.  2196M	Instruction manual
16	Machine does not operate at high speed.	• Is the sewing speed setting or backtack speed setting incorrect? Use the sewing speed control keys to set the high speed.	Instruction manual
17	Machine stops during sewing.	• Is the fixed stitch key turned on? Press the fixed stitch key so that the indicator turns off. • Is the power supply voltage too low? Check the power supply. (If the power cord is too long or too many appliances are being run from a single outlet, this may cause voltage drops which will in turn cause the reset function to activate and stop the machine, even if the power supply itself is normal.)	Instruction manual

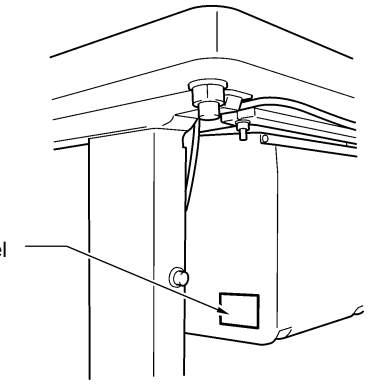
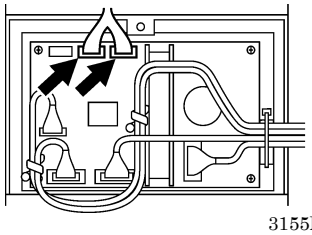
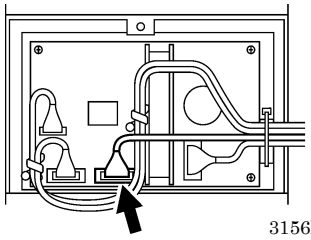
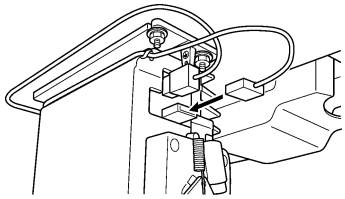
	Problem	Possible cause	Page
18	Nothing appears on the operation panel display.	• Is the power supply connector disconnected from the control box? Insert the connector securely.  2196M • Is the operation panel connector inside the control box disconnected? Insert the connector securely.  3154M	Instruction manual Instruction manual
19	"GrEASEUP" or "GU" flashes in the panel display when the power switch is turned on.	• This display is to notify you that it is time to apply grease. Apply grease.	44, 46

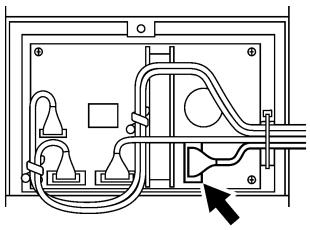
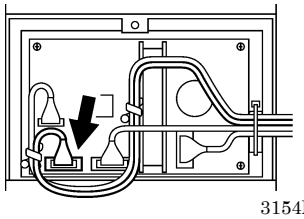
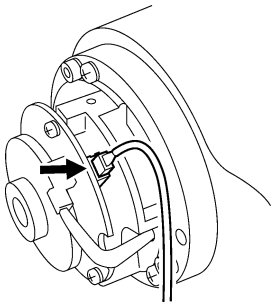
13-2. Error code displays

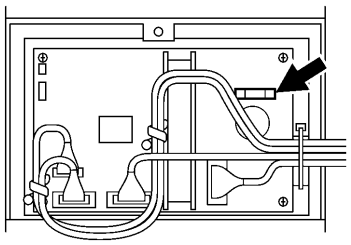
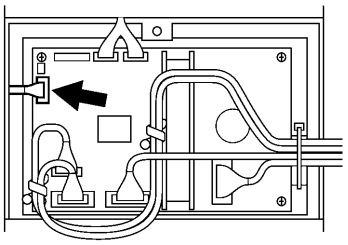
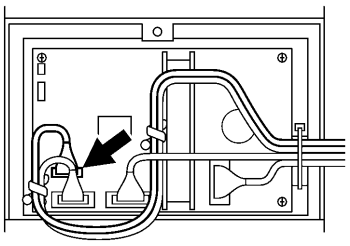
If an error code appears on the operation panel display

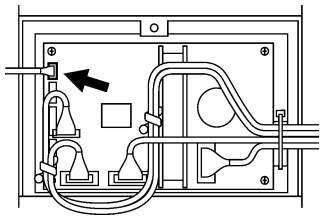
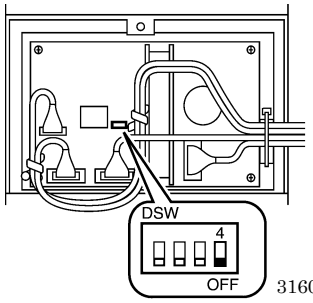
1. Make a note of the error code and then turn off the power.
2. After the operation panel display has turned off, eliminate the cause of the error and then turn the power back on.

2198M

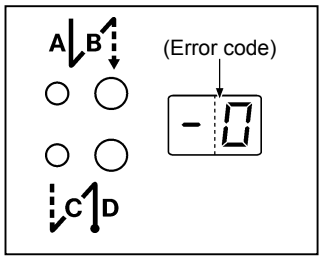
Error code	Possible cause	Page
Err 1 (Overvoltage)	• Does the power supply voltage match the control box voltage specifications? Check the voltage.  • Is the power supply voltage abnormally high? Check. • Problem with control box. Replace the control box. 2199M	50 50 49
Err 2 (Overcurrent)	• Is the electrical equipment connector inside the control box disconnected? Insert the connector securely.  3155M	52
Err 3 (Encoder error)	• Is the encoder connector inside the control box disconnected? Insert the connector securely.  3156M	52
Err 4 (Motor lock)	• Is the motor connector disconnected from the control box? Insert the connector securely.  • Has the machine locked up? Turn off the power and then turn the machine pulley by hand and check that it turns easily. 2202M	49

Error code	Possible cause	Page
Err 5 (Safety switch operated)	• Is the machine connector inside the control box disconnected? Insert the connector securely.  3157M • Is the machine head tilted back? Return the machine head to its normal position. Check the operation of the safety switch.	52 25
Err 6 (Voltage drop)	• Was the power turned on while the treadle was still depressed? Return the treadle to the neutral position, and then turn on the power switch. • Is the power supply voltage too low? Check the power supply voltage.	 54
Err 7 (Panel communication error)	This is displayed when there is a problem communicating with the operation panel CPU. • Is the operation panel connector inside the control box disconnected? Insert the connector securely.  3154M • Problem with operation panel or control box. Replace the operation panel or control box.	 52 49
Err 8 (Over time)	• This appears on the display when the sewing machine has been operating continuously for 3 minutes or more. Turn the power switch off and then back on again, and then operate the sewing machine normally.	
Err 9 (Motor overheating abnormally)	• This is displayed when the motor becomes abnormally hot and the temperature protection has activated. After the temperature has dropped, turn the power switch back on and operate the sewing machine as normal. • Problem with motor. Replace the motor.	 39
Err 10 (Solenoid overcurrent)	• This is displayed when there is overcurrent in any of the solenoids (thread trimming, thread wiping, quick reverse or presser lifter). Check the resistances of the solenoids. • Problem with control P.C. board. Replace the control box.	 55 49
Err 11 (Problem with motor over-heating sensor)	• Is connector CN5 inside the motor disconnected? Insert the connector securely.  3116M	

Error code	Possible cause	Page
Err 12 (Solenoid power supply error)	• Is solenoid fuse F2 (5A) blown? Replace the fuse.  3702M • Problem with control P.C. board. Replace the control box.	53 49
Err 13 (Treadle unit error)	• Is the treadle unit connector inside the control box disconnected? Insert the connector securely.  3158M • Is there an open circuit in the treadle connector harness? Replace the treadle unit.	52
Err 14 (Head detector unit error)	• Problem with head detector unit Check that the head detector unit connector inside the control box is securely inserted. Replace the head detector unit.  3703M	52
Err 15 (Problem with sewing machine motor operation)	• Problem with motor. Replace the motor. • Problem with power P.C. board. Replace the control box.	39 49
Err 16 (Thread trimming solenoid timeout)	• This is displayed if the sewing machine motor locks during thread trimming. Remove any thread scraps that may be blocking the motor. Check that there are no problems with the thread trimming mechanism.	
Err 18 (EEROM error)	• This is displayed if data could not be correctly read from or written to the memory element on the control P. C. board. Replace the control box.	49
Err 19 (Control box overheating)	• This is displayed when the control box becomes abnormally hot. (Three-phase high-voltage specifications only) Check that there are no problems with the cooling fan. If there is a problem, replace the cooling fan.	
Err 20 (Treadle pedal position error)	• The settings in “Setting method for standard depression stroke” may be incorrect. Redo the settings in “Setting method for standard depression stroke”. • Problem with treadle unit. Replace the treadle unit.	58, 60

Error code	Possible cause	Page
Err 21 (Thermistor error)	• Is connector CN16 inside the control box disconnected? Insert the connector securely.  3159M	52
Err 100 (GrEASEUP)	• This appears on the display when the sewing machine has continued to be used for a certain period after the “GrEASEUP” notification appears without the grease being applied (without the reset procedure being carried out). Apply grease and then carry out the reset procedure.	44
Err 101 (diP SW4)	• Is DIP switch No.4 inside the control box set to ON? Set DIP switch No.4 to OFF.  3160M	4

If an error code that is not listed above appears or if carrying out the specified remedy does not solve the problem, contact the place of purchase.

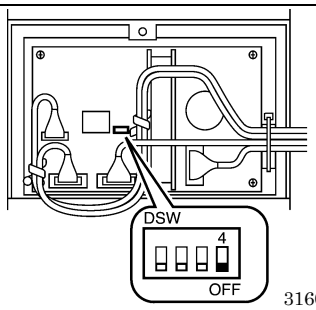


If an error code is displayed on the control box panel

1. Make a note of the error code and then turn off the power.
2. After the display of the control box panel turns off, eliminate the cause of the error and then turn the power switch back on.

3161M

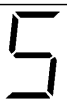
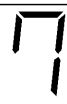
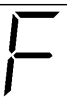
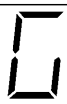
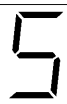
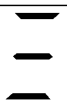
I

Error code	Possible cause	Page
-0 (Grease up)	• If you continue to use the sewing machine for a certain length of time without applying grease (and without carrying out the reset operation) after “GU” has appeared on the control box panel, this will be displayed. Apply grease and then carry out the reset procedure.	46
-1 (Dip switch 4)	• Is DIP switch No.4 inside the control box set to ON? Set DIP switch No.4 to OFF.  3160M	4
1	Overvoltage	Refer to pages 69-72 for the items corresponding to these error codes.
2	Overcurrent	
3	Encoder error	
4	Motor lock	
5	Safety switch operated	
6	Voltage drop	
7	Panel communication error	
8	Over time	
9	Motor overheating abnormally	
10	Solenoid overcurrent	
11	Problem with motor overheating sensor	
12	Solenoid power supply error	
13	Treadle unit error	
14	Head detector unit error	
15	Problem with sewing machine motor operation	
16	Thread trimming solenoid timeout	
18	EEROM error	
19	Control box overheating	
20	Treadle pedal position error	
21	Thermistor error	

If an error code that is not listed above appears or if carrying out the specified remedy does not solve the problem, contact the place of purchase.

14. SEGMENT DISPLAY DEFINITION TABLE

LCD display character list

0	1	2	3	4	5	6	7	8	9
									
A	B	C	D	E	F	G	H	I	J
									
K	L	M	N	O	P	Q	R	S	T
									
U	V	W	X	Y	Z				
									

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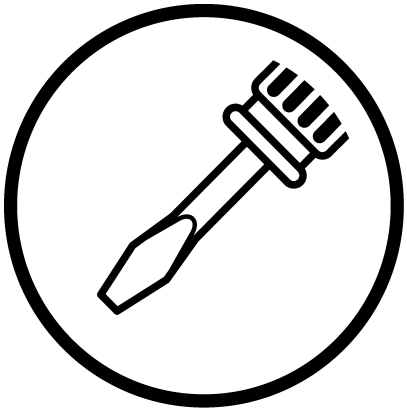

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